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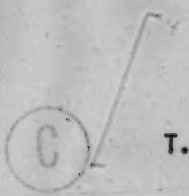
AN EXAMINATION OF THE EQUALIZING EFFECTS OF THE ALBERTA SCHOOL SUPPLEMENTARY REQUISITION EQUALIZATION GRANT



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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled AN EXAMINATION OF THE EQUALIZING EFFECTS OF THE ALBERTA SCHOOL SUPPLEMENTARY REQUISITION EQUALIZATION GRANT submitted by T. A. Milne in partial filfulment of the requirements for the degree of Master of Education.

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ABSTRACT

This study was a report of the effectiveness of the Supplementary Requisition Equalization Grant in equalizing wealth and tax effort among Alberta school jurisdictions in 1979. The relative effectiveness of the Supplementary Requisition Grant was further compared to the equalizing effects upon wealth and effort of a percentage-equalizing grant formulation.

The incidence of the Supplementary Requisition Equalization Grant (SREG) was found to result in improved equalization of wealth or assessment per pupil. The equalizing effect upon wealth per pupil variations among Alberta school jurisdictions was found to be significant for the jurisdictions in the sample. The effect upon wealth equalization of the save harmless provision was found to be minimal but tending toward greater rather than lesser equalization of per pupil wealth among jurisdictions.

The equalization of tax burden or effort was found to be improved as a result of the incidence of SREG support. The greater equalization of mill rates among jurisdictions was found to be statistically significant if the revenue from the grant was required and would otherwise have been raised to meet operating expenditures. Again, the effects of the save harmless provision were not found to be statistically significant.

The comparative analysis of a percentage-equalizing grant formulation with the SREG formulation indicated no significant differences in

wealth or effort-equalization between SREG and a percentage-equalizing formulation structured to provide similar levels of support.

It became evident that the SREG formulation was mathematically equivalent to the percentage-equalizing formulation except for two provisions in the SREG formulae. The first of these provided for proration of the grant to eligible jurisdictions which had a taxation (mill) rate below the rate specified in the formulation. The second was a save harmless provision which allowed a jurisdiction to receive at least 80 per cent of the grant revenue allocated in the previous year. Therefore, the testing of the percentage equalization formulation became in effect the testing of SREG without the two provisions noted above. Then because no significant differences were found in wealth or effort equalization created by the incidence of the percentage-equalizing grant formulation in comparision to the regular SREG, it was concluded that the proration of grants provision did not have a significant effect upon the equalizing potential of SREG for those jurisdictions in the study for 1979.

A general conclusion of the study was that the Supplementary Requisition Equalization Grant had resulted generally in a significantly greater degree of equalization of wealth and effort among the jurisdictions in the study. It was also concluded on the basis of further analysis that higher levels of support would have resulted in more equalization.

Several implications of the study were noted and some suggestions for further research were presented.

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CHAPTER I

THE STUDY

INTRODUCTION

Garms, Guthrie, and Pierce (1978:187), in addressing the problem of distributing state aid for education, stated:

> The last goal of school finance has been that of equity. This is usually expressed as "equality of educational opportunity." There are many possible definitions of equality of educational opportunity, but in practice it has been limited to assuring equal dollars per student or to assuring enough money to provide comparable programs for students when their different needs and the costs of providing them have been taken into account: differences in wealth, differences in educational need, and differences in educational cost. Separate remedies are appropriate for each, and the three must be combined in constructing a school finance plan that is truly equitable.

Two decades earlier, the report of the Royal Commission on Education in Alberta (Cameron, 1959:225) summarized its major emphasis on equalization of educational opportunity in its recommendations to the Alberta government in the following terms:

> The Commission has given vigorous support to the equalization of educational opportunities for all children--through expanded curriculum and access to well-qualified teachers. The abilities of school boards to achieve these conditions depend upon their tax resources and school grants. If a reasonably uniform quality of basic education is to be achieved in Alberta, the discrepancies in tax resources must be corrected by school grants. Equalization grants are vital in equalization of educational opportunity.

The Alberta School Foundation Program Plan which was implemented in 1961 appears to have adopted many of the recommendations of the Commis-

sion. As Deiseach (1974:2) noted, equalization of educational opportunity was a major goal in the funding system for education in Alberta.

A review of the literature revealed an implicit assumption that a basic requirement for the equalization of educational access or opportunity is fiscal equalization among school jurisdictions. Fiscal equalization may mean only that districts receive equivalent funding for equivalent programs on a per classroom teacher, per classroom unit (CRU), or per weighted pupil basis. Equivalent funding for equivalent programs, however, may be disequalizing in that such funding does not account for differentials in the costs of providing educational programs nor does it account for differentials in program needs among jurisdictions. Thus unequal state (provincial) funding may be necessary in order to obtain a greater degree of fiscal equalization among local school jurisdictions. Further, if local taxpayers are required to bear a portion of the costs of an educational program mandated by a state or provincial government, there is need to seek equalization of both wealth and taxation effort among jurisdictions in order that the quality of a child's education or his access to education shall not be dependent upon the wealth of the school jurisdiction in which he resides nor upon the degree to which the taxpayers in the jurisdiction are willing to tax themselves in order to support his education.

In much of the literature reviewed, the notion of fiscal equalization as an aspect of equality of educational opportunity was delineated in terms of some or all of the following: (1) Equalization of wealth (ability) among jurisdictions on a per pupil, per CRU (classroom unit), or per teacher basis; (2) Equalization of taxation rates (effort) among jurisdictions; (3) Differential state (provincial) funding to offset

differential costs among school jurisdictions for the provision of equivalent basic educational programs; and, (4) Differential state (provincial) funding to offset differential costs associated with differing educational needs among jurisdictions.

In Alberta, several grants allocated under the Alberta School Grants Regulations are designed to provide some degree of equalization support in order to offset differential costs among school jurisdictions providing equivalent educational services and to offset the differential costs among school jurisdictions arising from provision of programs to meet special needs. Among the fiscal equalization grants, as they are called, the supplementary requisition (local school taxation) equalization grant is possibly the most important in terms of its impact upon local revenues for education and upon taxpayers. Further, the Supplementary Requisition Equalization Grant (hereinafter referred to as SREG) is the sole grant in Alberta's educational funding arrangement which is directly focussed upon the aspect of fiscal equalization which received most emphasis in the literature reviewed: the equalization of wealth and thus the equalization of the local educational tax burden.

Prior to the introduction of SREG in 1975, the report of the Alberta Commission on Educational Planning (Worth, 1972: 292-293) summarized the necessity for implementing a grant to equalize local taxation effort support of education:

> If the present system of supplementary requisitions were continued, then the recommendations aimed at providing equity in basic education would be disturbed because of wide disparities in property assessments and tax rates between school districts. . . . To compensate for these inequities a provincial equalizing supplementary grant which would permit additional provincial aid to flow predominantly to school districts, divisions or counties with low assessment per pupil is essential.

THE PURPOSES OF THE STUDY

As the subsequent review of the literature indicates, several researchers have suggested that Alberta has achieved a substantial degree of fiscal equalization among the school jurisdictions in the province. A major purpose of this study was to test the supplementary requisition equalization grant formulation (SREG) in order to determine the degree of fiscal equalization which was obtained from the Supplementary Requisition Equalization Grant. A second purpose of the study was to determine whether a greater or lesser degree of fiscal equalization might have been achieved if an alternative fiscal equalizing scheme had been implemented instead of the SREG.

The first purpose of the study has been addressed by the following questions:

1. Fiscal Equalization: The SREG Formulation

   1.1 To what extent was equalization of wealth among Alberta school jurisdictions achieved through the supplementary requisition equalization grant?

   1.2 To what extent would equalization of wealth have been enhanced if the "grandfather" or save harmless provision had been absent from the SREG formulation?

   1.3 To what extent was equalization of effort for required local taxation achieved among Alberta school jurisdictions through the supplementary requisition equalization grant?

   1.4 To what extent would equalization of effort for required local taxation have been enhanced if the "grandfather" or save harmless provision had been removed from the SREG formulation?

The second purpose of the study has been expressed in the following questions:

2. Fiscal Equalization: A Percentage-Equalizing Formulation

2.1 Would a percentage-equalizing grant formulation have achieved a greater or lesser degree of wealth equalization among Alberta school jurisdictions if it had been used in place of the SREG?

2.2 Would a percentage-equalizing grant formulation have achieved a greater or lesser degree of effort for required local taxation among Alberta school jurisdictions if it had been used in place of the SREG formulation?

DELIMITATIONS, ASSUMPTIONS, AND LIMITATIONS

Delimitations

This study was delimited to Alberta school jurisdictions and primarily to a one year time period, the 1979 calendar year. The year 1979 was chosen because, at the time of the study, it was the latest year for which data were readily available.

Property or local taxes in this study were delimited to property taxes used to fund education. The extent to which municipal taxation for other purposes affected or influenced taxation of property for education was beyond the scope of this study.

Further, local mill rates (rates of taxation) in this study were delimited to equalized mill rates (rates on equalized assessments) and net mill rates which reflect both equalized assessment and the incidence of electric power and pipe line tax revenue. Live mill rates were not considered in this study.

Assumptions

This study was predicated upon the following assumptions. First, in the computation of an expenditure factor for each jurisdiction, it was assumed that differences in per pupil expenditures among jurisdictions reflect corresponding differences in per pupil costs incurred in providing equivalent educational programs. While the assumption is at best tenuous, determination of actual cost differentials was considered beyond the scope of the study.

Second, for the purposes of this study, it was assumed that the assessment practices in Alberta were substantially uniform from one jurisdiction in the province to another. Thus it was assumed that the value of an assessment in one jurisdiction was equivalent to an equal assessment value in another jurisdiction. This adjusted equalized assessment (adjusted to reflect the incidence of electric power and pipeline tax revenue) per resident pupil was assumed to be a relatively accurate comparative measure of wealth or ability to pay among school jurisdictions.

Third, for the purposes of this study it was assumed that property assessments are a relatively reliable measure of wealth or ability to pay. Deiseach (1974:89-90), in his study of fiscal equalization in Alberta, 1961 to 1971, concluded that there was ". . . a strong relationship between equalized assessments and personal disposable income, at least outside the five big cities."

In association with the foregoing assumption, it was further assumed that the net mill rate is a reliable index of taxpayer effort or tax burden. Examination of the relationships between mill rates and

personal disposable income were considered beyond the scope of this study.

For the purposes of this study, it was assumed that the provincial grants (allocations under the Alberta School Foundation Program Fund Regulations and the Alberta School Grants Regulations) provided substantial equalization of costs associated with provision of differential (exceptional) programs in addition to providing for differing per pupil costs among jurisdictions related to the provision of essentially equivalent basic educational services.

It was further assumed that the local school taxation levy (above the basic School Foundation levy) in each jurisdiction was not entirely for the support of enhanced educational services. Rather, it was assumed that in part the support of a minimum basic educational program in each jurisdiction required local tax revenue (the supplementary requisition). Because the amount of local required taxation (beyond the School Foundation levy) varied from one jurisdiction to another, it was assumed that the provincial average per pupil local school supplementary requisition tax revenue adjusted to account for operating surpluses and deficits was a reasonable measure of required local supplementary support.

Limitations

A major limitation of this study is that it is a study of the effects of one particular component, a grant to achieve a degree of equalization in per pupil revenues, of Alberta's education finance system examined over a limited period of time. Given the foregoing limitation, the applicability of the findings of the study to other

provinces is limited by the extent to which there are similarities among Alberta's educational funding arrangements and those of other provinces.

A second limitation of this study is that it does not take into consideration the potential equalizing effects of other specific grants, such as the Small Jurisdiction, the Small Schools Assistance, and the Location Allowance grants. While these grants are not directly related to equalization of local ability to pay and to tax effort, nevertheless the incidence of these grants will affect local rates of taxation within jurisdictions receiving such grants.

A third limitation of this study is that the calculation of per pupil revenues and expenditures as well as grant allocations are estimates. Figures taken from the Annual Reports are simply an indication of the relative revenue and expenditure position of each jurisdiction at a particular time (i.e., the deadline for submission of accounting reports). In addition, there are accounting difficulties which arise as a result of school systems operating on a school year for educational matters but on a fiscal year for financial reporting.

DEFINITIONS OF TERMS

Although each major term used in this study is defined at an appropriate place in the study, brief definitions of some of the commonly-used terms are set forth in the following:

Ability to Pay (Wealth):

> Taxpaying ability refers to the capacity of a school jurisdiction to generate property tax revenues to support education. Ability to pay in this study is considered synonymous with assessment per resident pupil.

Assessment (Assessed Value) of Property:

Assessment refers to the value assigned to real property for the purposes of taxation.

District Power Equalizing:

"Power-equalizing" or "district power-equalizing" (D.P.E.) is a form of percentage equalizing formulation in which equalization of assessment (assessed valuation) per pupil is based on the total wealth of the state (province). The equalization aid provided in the formulation developed by Coons, Clune, and Sugarman (1970:204-239) is based on an aid ratio which is equal to one minus the local fiscal capacity (assessment per pupil) divided by the assessment per pupil in a "key" district. The "key" district is apparently the one with the assessment per pupil to which the state determines it will equalize.

Garms, Guthrie, and Pierce (1978:198) suggested that the plan amounts to a guarantee of a certain number of dollars per pupil per mill levied. The amount of state aid is then a direct function not of the wealth of a district but of the rate at which the district is prepared to tax itself.

In the view of Coons, Clune, and Sugarman (1970:204-239) the rate of taxation or effort which taxpayers make to support education should be a matter of local volition. A guaranteed per pupil assessment equalizes taxation effort among jurisdictions at a taxation rate sufficient to generate the required local contribution to support a basic educational program. Higher rates of taxation than the required rate in some or all of the jurisdictions would then be a measure of local choice of the degree to which taxpayers wish to enhance their particular educational programs. Thus through such a system two major ends may be served: first, fiscal equalization in terms of wealth and required effort may be substantially equalized; and second, a degree of local fiscal autonomy may be maintained.

Disequalizing effects upon educational opportunity become evident, however, if school jurisdictions are allowed freedom to tax themselves above the required rate at whatever rate they determine. Further, a state or provincial unconditional guarantee of a grant, the amount of which is determined by a locally established taxation rate, may not be legislatively acceptable at a state or provincial level. Atherton (1971:63) noted that ". . . such systems are not popular among governments inasmuch as it may be claimed . . . that the determination of the total provincial budget for education rests with local and not provincial legislatures." Garms, Guthrie, and Pierce (1978:195-196) observed that all states which have adopted a percentage-equalizing or power-equalizing system

have placed maximum limits on the level of equalization grant revenue which the state will provide.

Effort (Tax Effort):

Effort in this study is considered the degree to which the electorate in a school jurisdiction are willing to tax themselves in order to provide educational services. In this study, comparative degrees of tax effort are measured by the equalized mill rate and by the net mill rate.

Eligible Pupil (Eligible Enrolment):

An eligible pupil is one for whom a school board is entitled to receive financial support from the School Foundation Program Fund and the School Grant Regulations. Dependents of Indians and Department of National Defense personnel are not eligible because support for their education is primarily a responsibility of the federal government.

Equalized Assessment:

Assessment of all property in Alberta was standardized for grant purposes (Deiseach, 1974:10). It is a property valuation based on live assessments but because municipalities do not conduct assessments at the same time, the Alberta Assessment Equalization Board computes an annual equalized assessment figure for each municipal authority. This figure provides comparability of assessments from one jurisdiction to another, regardless of when a general live assessment was made. The sum of all equalized property values in a school jurisdiction is known as the equalized assessment of the school jurisdiction.

Imputed Assessment:

Government allocations or grants to equalize property taxes may be evaluated in terms of the additional assessment which would be required at a given taxation rate to produce the tax revenue equivalent to the grant. In this way the effects of the grant upon wealth equalization may be measured. The assessment represented by a grant is equal to the grant divided by the given taxation rate (often the rate which figured in the initial calculation of the grant).

Percentage Equalizing:

Meek (1979:28) stated:

> Harlan Updegraff was supportive of the values and goals for state finance outlined by Cubberley but saw the concept of local effort as relatively more important. . . . He felt that the participation of the local citizens and the responsibility of local government should be encouraged by making the state's contribution to education contingent on local action. He advocated that when local government raised the true tax rate (or lowered it) that the state should follow suit.

Johns and Morphet (1975:208) summarized the principles underlying a "percentage equalizing" system for state (provincial) education support in the following points:

(1) Local support is fundamental.

(2) The local units for the support of local schools should contain, insofar as is practicable, enough property taxable for school purposes to raise that portion of the expenses of the school which it is believed should be borne by the local districts without an undue burden upon the owners of the property.

(3) Some portions of the support of local schools should come from the state government, the amount being dependent on certain factors, exact standards for which have not been scientifically determined, but which will vary in the different states.

(4) The administration of state aid should be such as to increase the efficient participation of citizens.

(5) The purpose of state aid should be not only to protect the state from ignorance, to provide intelligent workers in every field of activity, and to educate leaders, but also to guarantee each child, irrespective of where he happens to live, equal opportunity to that of any other child for the education that will best fit him for life.

Updegraff, the originator of percentage equalizing, operationalized his model in the following manner (Johns and Morphet, 1975:209):

(1) The state undertook to support variable levels of minimum programs ranging from $840 per teacher unit to $2,160, depending upon the amount of local tax effort. Cohn (1974:20) defined a teacher unit as ". . . a standard number of pupils per teacher which could vary for different types of classes."

(2) A sliding scale would provide increasing amounts of state aid per teacher unit for each increase of 1/2 mill of school taxes levied ranging from 3 and 1/2 to 9 mills.

(3) Proportionately more state aid was allocated for districts with a low true evaluation (assessed value).

Garms, Guthrie, and Pierce (1978:195) noted that percentage equalizing models have certain practical problems, the most important being that each district determines its own budget, and the state allocates funds according to the aid ratio established for that district. Thus theoretically a budget is unrestricted except by the district's ability to pay its share. Garms, Guthrie, and Pierce (1978:195) noted that states which have adopted percentage equalizing plans have placed ceilings on the per pupil expenditure for which the state will provide equalization.

The re-emergence of percentage equalizing, according to Johns and Morphet (1975:209), began with its re-discovery and re-christening by Coons, Clune, and Sugarman (1979) as "power-equalizing." Garms, Guthrie, and Pierce (1978:195) traced its re-emergence to Benson (1961), who popularized the concept in his book, The Economics of Public Education.

The disadvantages of such a system have been noted in the definition of district power equalizing, for the two plans in their basic forms are similar. As Garms, Guthrie, and Pierce (1978:219-221) point out in their discussion, district power equalizing need not guarantee a fixed number of dollars per pupil per mill, while the percentage equalizing formulation does so.

Resident Pupil Enrolment (Resident Pupil):

The resident pupil enrolment is the number of pupils for which a school board is responsible with the exception of dependents of Department of National Defence personnel, treaty Indians and Metis, and any students from another jurisdiction attending school under a tuition agreement. The resident pupil enrolment includes students for whom a board is responsible who are attending schools in other jurisdictions with which the school board has tuition agreements.

Supplementary Requisition

The supplementary requisition is a locally-determined levy upon real property to support educational services in a school jurisdiction. The levy is additional to the uniform provincial levy, the School Foundation Program Fund levy upon corporate and commercial assessments.

Tax Rate (Mill Rate):

The mill rate is the rate of taxation determined by dividing the revenue to be raised from the tax by the assessment of the jurisdiction. The number obtained is usually multiplied by 1,000 for the purposes of communication. In this study, the mill rate is based on the equalized assessment rather than upon a live (actual) mill rate on the unequalized assessment established within the municipal jurisdictions.

ORGANIZATION OF THE THESIS

The purpose of the study and a statement of the problems for research has been presented in this chapter. Also included in this chapter were delimitations, assumptions, and limitations as well as definitions of terms used in the rest of the chapters. Chapter II is devoted to a review of the literature. Chapter III is a presentation of a description of the research methods employed in the course of the study. The results of the data analyses conducted are presented in Chapter IV. A summary of the findings of the study and implications for further research are presented in Chapter V.

CHAPTER II

REVIEW OF RELATED LITERATURE

The purpose of this chapter is to present a brief review of selected literature in the theory, history, and practice of education finance to provide a background for an examination of the school finance arrangements in Alberta. The first section of the chapter is an introduction, a consideration of some of the major concepts upon which various approaches to funding education have been formed. A brief description of the Alberta education finance system is presented in the second section. The third section is devoted to a description of school financial arrangements in Alberta, particularly as these arrangements affect fiscal equalization and provincial-local cost sharing for education.

INTRODUCTION

At the outset, it is assumed that one of the major concepts implicit in the orderly functioning of a democratic society is a degree of equality which is one aspect of the concept of equity. Brown (1974:1) stated:

> The concept of equality as a positive social value is young; its evolution has been linked with that of democracy as a political ideology. When equality is viewed as something more than a synonym for "fairness," "equity," or "justice," there are at least two of its aspects which are important . . .: equality of outcomes and equality of opportunity.

As the two aspects of equality noted by Brown apply to the funding of public education, it seems clear that absolute equality of outcomes is not an achievable goal through education alone, for equality of outcomes for all citizens would require that all social benefits be equally distributed. Such a requirement is not an objective which a system of education alone could reasonably be expected to achieve: absolute equality of outcomes is a political and economic matter involving sweeping changes in prevailing social values. Garms, Guthrie, and Pierce (1978:24) suggested that ". . . even if instructional techniques were so refined as to give each normal child an equal life chance, . . . the resource level necessary to implement it would undoubtedly be staggering."

In practice, however, educational finance plans have tended to be based on more limited objectives. The Minister's Advisory Committee on School Finance (1975:4) stated that one of the objectives of a provincial educational finance plan should be the equalization of educational opportunity, which the committee viewed ". . . as equality of access of students to programs and services rather than equality of outcomes. Equality of educational opportunity does not necessarily mean equality of results."

A number of writers (Berne, 1978:2; Garms, Guthrie, and Pierce, 1978:21-23; Burke, 1978:4; Jones, 1978:1) view equal treatment of equals as basic to the concept of educational access. Recognition of the idea of equal treatment of equals is also viewed as a basic requirement of a taxation system to fund education.

The principle of equal treatment of equals also implies its opposite: the unequal treatment of unequals. Extending the argument

presented by Thomas (1980:246-247), providing a mentally handicapped child with exactly the same program and instruction as a "normal" child would be equal but not equitable treatment. Thus in the same way as the program and instruction for a handicapped child is shaped to fit his needs, so also should an equitable funding arrangement provide additional funds for the education of the handicapped child if his program and the instructional technology for his education were more expensive than for the education of the "normal" child. If both normal (equals) and the handicapped (unequals) are to be granted equalized educational opportunity, then it is necessary to fund unequally if the two programs are not equal in cost.

Berne and Stiefel (1979:112) identified three principles of equity which are related to equality of educational opportunity: horizontal equity, vertical equity, and equal opportunity.

> Horizontal equity is defined as equal treatment of equals, while vertical equity requires that unequals receive appropriately unequal treatment. Equal opportunity can be defined as a lack of discrimination on the basis of characteristics such as race or sex.

Berne and Stiefel (1979:116-117) posited the view that as the principles of equity noted in the foregoing quotation are applicable to students, so also are the first two principles, horizontal equity and vertical equity, related to equity for the taxpayer:

> The principles of horizontal and vertical equity can be applied to taxpayers differentiated by ability to pay. Equal tax incidence for taxpayers with equal ability to pay is an expression of horizontal equity. . . . Vertical equity is concerned with the variation in tax incidence associated with different levels of ability to pay.

Berne and Stiefel further noted that the principles of horizontal equity and vertical equity are also applicable to an examination of equity or

of fiscal equalization between school jurisdictions. Brown (1974:37-41) established essentially the same ground in his discussion of the role of central governments in the funding of education.

If education were strictly a local matter and the provision of educational services and the economic and social benefits and/or disbenefits accruing therefrom were confined to each local jurisdiction, then questions of equity and of the arrangements by which educational services are funded would be largely irrelevant, or at best a matter of purely local concern. Such, however, is not the case. Many economists from Adam Smith (1776:56-58) and John Stuart Mill (1859:317-319) to Garms, Guthrie, and Pierce (1978:47-50), Alexander Kern (1976:429-467), Theodore Schultz (1979:6ff.), W. J. Brown (1974:33), and E. J. Hanson (1979:77) have noted the public benefits of education. W. J. Brown (1974:33), for example, stated:

> Education is one of those public services which provides benefits that are both "individual and collective" in nature. It directly benefits the educated individuals and their families in the sense of "cultivating" the individual as well as in the sense of providing economic benefits such as earning ability or the license for entry to certain occupations. . . . It is also likely that all citizens of a community also benefit from the education provided for persons of that community. . . . To some extent, then, educational services are "collective" in the same sense as fire protection, the spillovers or externalities from the educational services provided in a given community may extend far beyond its own boundaries by virtue of the freedom of individuals to migrate from one community to another. The more people migrate, the greater the externalities or spillovers generated.

Migration seems to be a fact of North American life, and it is not within the power or authority of an individual local jurisdiction to control "spill-in" educational benefits or disbenefits resulting from migration. Further, a jurisdiction suffering a net loss of population

which it has educated has little incentive to tax itself at higher rates to provide better education.

Thus, following Brown (1974:35-37) and Breton (1965:183), it is in the public interest for a higher level jurisdiction (provincial, state, or federal) to intervene so as to minimize the effects of "spill-in" and "spill-out" educational costs (Benson, 1978:136-139). Provision of incentive or conditional and unconditional grants by a central authority is a common means of minimizing externalities. In order to equalize "spill-in" and "spill-out" educational benefits and costs, it is necessary for a central authority to seek to equalize student access to education among local jurisdictions under its political control.

A major step in equalizing educational access among local jurisdictions is intervention (via grants) by the central authority (state or provincial) in order to equalize expenditures among the local jurisdictions (Moffatt and Brown, 1973:146). Such an intervention assumes that differences in educational expenditures among jurisdictions are a measure of quality differences of educational programs (Bumbarger and Ratsoy, 1975:3). However, as Bumbarger and Ratsoy (1975:3) noted, interjurisdictional differences in educational expenditures may result from differential population densities and jurisdiction sizes. In addition, climate and/or the presence of racial and ethnic minorities could also account for expenditure differentials among districts (Chambers, 1980:268). Thus equalization of educational access among districts may require unequal funding by the provincial or state government.

In the United States and Canada, education is the constitutionally established responsibility of each state or province in the respective country. In Canada, section 93 of the British North America Act gives each province control of education. While such a provision in effect allows the provincial authority unilaterally to change, consolidate, or to dissolve local school jurisdictions, in practice political expediency has been ". . . the rationale for . . . a federal structure of government . . ." (Brown, 1980:9). Joint control of education primarily between local and provincial (state) governments has been the practice followed in both countries: in the U.S., despite legislative consideration in several states (Benson, 1978:341-346), full state funding has been adopted only in Hawaii (Garms, Guthrie and Pierce, 1978:200). In Canada, no provincial government has implemented a full funding model, although the educational funding arrangements in Prince Edward Island, New Brunswick, and Newfoundland might be considered de facto full funding schemes (Canadian Teachers' Federation:1980). Some degree of local control of education has continued to be a component of nearly all provincial and state elementary and secondary education systems.

In the literature reviewed, there was general consensus that local control of education (which represents a decentralization of provincial or state control) has several important advantages over full control of education by a central authority. Some of the advantages are summarized in the following, which is by no means all-inclusive:

1. Local control allows parents to influence the type of education services provided by the central authority. Moffat (1957:44) stated: "Only through local administration can the religious influence and the tradition of parental responsibility express itself in

the amount and type of education to be given to our children." Similar views were echoed in whole or in part by Benson (1978:141), Brown (1974:17), Garms, Guthrie and Pierce, (1978:30-31), Coons, Clune, and Sugarman (1970:14-20), and Moffatt and Brown (1973:92). Johns and Morphet (1975:9) recognized the value of local control and its re-emergence in the movement toward more community involvement in education.

2. "Local control or decentralization is more flexible, offering . . . some security against a mistaken judgement being widely accepted for a long period of time" (Brown, 1974:18). Benson (1961:227) reflected the same view.
3. "The operation of local government stimulates educational spending" (Benson, 1978:142). Mort and Reusser (1951:85), and Johns and Morphet (1975:338-339) supported the contention.
4. In a federal system decentralization of educational control is possibly the best means of coping with the regional ethnic, racial, and religious diversity of the population and their variety of demands in terms of educational service. Brown (1980:7-8) seemed to concur; Coons, Clune, and Sugarman (1970:17-19) reflected a similar perspective.
5. Local control of education may result in greater accountability of appointed officials and professional staff to the public for whom the service is provided. Benson (1978:139) and Coons, Clune, and Sugarman (1970:18) emphasized the necessity for accountability through decentralized control.

While the preservation of decentralized (local) control of schools seems to be a goal worth pursuing given the advantages noted, complete

decentralization is disequalizing in terms of education opportunity and fiscal equalization (Moffat and Brown, 1973:94-99; Carr, 1933:32; Mort and Reusser, 1951:66-67; Johns and Morphet, 1975:200). Many of the theorists in school finance have attempted to create models of funding arrangements to offset the disequalizing effects of decentralized control with provincial (state) intervention. Benson (1978) and Johns and Morphet (1975) summarized the problem of balancing centralized and local control of education. Benson (1978:142) established a relatively neutral position:

> What it comes to is that neither complete centralization nor decentralization appears appropriate as a guiding principle in . . . education. . . . Local authorities might continue to hold revenue-raising powers, but state and federal governments should continue to distribute grants, particularly to poorer districts and to those in which student achievement is low. Such a system is not tidy, but it is what has evolved . . . and apparently for good reason.

Johns and Morphet (1975:338) seemed to take a more pro-centralization view:

> The problem is basically one of how to obtain the benefits of needed centralization and, at the same time, suffer no significant loss in freedom. . . . Specifically applied to education, the problem is how to obtain the benefits of central taxation, and at the same time retain freedom in, and even improve decision making at . . . local levels. . . . Centralization of the process of obtaining funds for schools does not need to result in centralization of responsibilities for administration and operation of schools.

In summary, if some degree of local control of educational funding is to be maintained, fiscal intervention by a government representing all jurisdictions is necessary to obtain some degree of fiscal equalization and thus a measure of equality of educational access. Within a political framework which seeks to maintain a degree of local autonomy, fiscal equalization may be defined in terms of the objectives of many of the educational funding models which have been developed.

OBJECTIVES OF EDUCATION FUNDING MODELS

In the literature reviewed, all of the education funding models from the Cubberley Flat Grant Plan (in Cohn, 1974:15-16) to Morrison's Full State Control (in Johns and Morphet, 1975:215) or education vouchers have sought to address one or more of the following objectives, all of which are aspects of equality of educational opportunity.

1. Equality of Educational Access (Horizontal Equity)

As the following descriptions of some of the major educational funding models will show, equality of educational access normally means provision of a basic educational program for all students. However, in the provision of a basic program for students, it may be necessary for a central government to provide differential funding to school jurisdictions in order to offset differing per unit costs associated with the provision of such a program. Thus "equal treatment of equals" would require unequal funding in order to provide equal treatment.

The summary report of school finance programs in the U.S., Public School Finance Programs, 1978-79 (Tron, 1980), indicated that many of the states provide additional differential funding for such cost variables as pupil transportation, population sparsity, small schools, and declining enrolments. In Canada, six of the ten provincial school finance systems in 1979 included provisions for additional funding for declining enrolments; all provincial systems except those of New Brunswick and Manitoba provided compensatory funding to offset higher costs associated with population sparsity (Canadian Teachers' Federation, 1980). Manitoba implemented sparsity support in 1981.

2. Equality of Educational Access (Vertical Equity)

In cases where the basic program is not sufficient to equalize opportunity, it may be necessary to provide exceptional educational services and programs to seek to satisfy exceptional student needs. Again, it may be necessary to provide differential levels of funding in order to offset the differential (and usually higher) per unit costs associated with the provision of exceptional programs.

In Canada, the Canadian Teachers' Federation summary of provincial school finance systems (Canadian Teachers' Federation, 1980) reported that eight of the provincial finance arrangements made specific provision for additional funding for special education in 1978-79. In the United States, the 1979 summary (Tron, 1980) indicated that all fifty states made provision for funding special education programs (i.e., special programs for pupils with mental and/or physical handicaps). In addition, reports from seventeen states included information suggesting that grants additional to basic allocations were available for special programs for culturally disadvantaged pupils.

3. Fiscal Equalization: Effort

Basic to some of the educational funding models described is the notion that tax burden should be approximately equivalent for taxpayers (Berne and Steifel, 1979:116-117; Carroll, 1979). Where the funding arrangement includes a required contribution for taxpayers based upon a property tax, then some system for achieving uniform valuations of property becomes necessary. Hence many of the educational funding systems in operation in the United States (Tron, 1980) employed a system of equalizing property assessments within the state. In Canada, each of the provincial funding arrangements utilized wealth valuations based on

a province-wide assessment system (equalized assessment) (Canadian Teachers' Federation, 1980).

If the measure of wealth is equivalent among school jurisdictions, then tax effort required by educational funding arrangements should be equivalent if the arrangement is to be equitable. Variations in local taxation effort beyond a required minimum in a provincial (state)-local educational cost sharing arrangement should be related to local volition or "leeway" in the degree of program enhancement desired.

To control the disequalizing effects of local leeway upon the quality of the educational program among school jurisdictions, Tron (1980) reported that twenty-two of the state educational funding systems placed legislative limits upon district levies in 1979. The Canadian Teachers' Federation (1980:33) reported that in 1979 only three provinces, New Brunswick, Alberta, and British Columbia, had legislation to limit a school district's power to raise local revenues.

4. Fiscal Equalization: Wealth

Where the funding arrangement includes a required local contribution, equalization of wealth is necessary. Such equalization may be achieved through the equalization of assessments on a state- or province-wide basis as was noted previously. If, however, local taxation is required to meet the costs of either a basic educational program as noted in (1) above or to meet the costs associated with the provision of exceptional programs, then it is incumbent upon the state or provincial government to attempt to achieve some degree of wealth equalization via grants-in-aid such that taxation effort will be substantially equalized.

A proposed definition of equality of educational access or opportunity among school jurisdictions, then, includes the following aspects or dimensions:

1. Equalization of differences in basic program provision costs.
2. Equalization of differential costs associated with provision of exceptional programs.
3. Equalization of required local taxation effort for education.
4. Equalization of wealth on a per unit basis.

The purpose of this study, however, is concerned only with the latter two fiscal equalization aspects of equalization of opportunity as these are related to local taxation for education: the equalization of wealth, or the ability to pay, and the equalization of effort for that portion of the local school tax which is required for support of the basic educational program.

The School Foundation Plan and Local Taxation

In their study of school financing in New York State in 1922-23, Strayer and Haig noted the disparities among districts in per pupil expenditure and in taxpayer effort. As an alternative to the Cubberley Flat Grant Plan (Benson, 1968:158-166), Strayer and Haig developed a system designed to equalize expenditures among districts and to distribute state aid equitably. Atherton, Hanson, and Berlando (1969:43-44) described the basic assumptions in the plan as follows:

> Their plan had two major essentials: first, they considered that there should be uniformity in the rate of school taxation to be levied for the provision of a satisfactory level of education throughout the state; secondly, they considered that there should be such a degree of state control over the proceeds of the school taxes so as to ensure that the satisfactory minimum offering should be provided at a reasonable cost.

Strayer and Haig (in Benson, 1968:162) delineated a means of operationalizing the plan after the state established the per pupil cost of a satisfactory minimum educational plan:

> (1) A local tax in support of the satisfactory minimum offering should be levied in each district at a rate which would provide the necessary funds for that purpose in the richest district.
>
> (2) This richest district then might raise all of its school money by means of the local tax, assuming that a satisfactory tax, capable of being locally administered, could be devised.
>
> (3) Every other district could be permitted to levy a local tax at the same rate and apply the proceeds toward the costs of schools, but
>
> (4) Since the rate is uniform, this tax would be sufficient to meet the costs only in the richest districts and the deficiencies would be made up by the state subventions.

Johns and Morphet (1975:211) noted the fact that:

> . . . Strayer and Haig emphasized the equalization of the tax burden to support schools as well as the equalization of educational opportunity. However, they did not incorporate the reward for effort or incentive concepts in their state support model. They attacked these concepts which had been advanced by Cubberley and Updegraff. . . .

In evaluating the contribution of Strayer and Haig, Cohn (1974:50) stated: "Variations of the Strayer-Haig-Mort Minimum Foundation Plan are still the most popular form of state assistance to the schools." In Canada, the foundation plan has been modified and in 1979 was in operation in six of the ten provinces (Canadian Teachers' Federation, 1980:2-7).

Paul R. Mort: Modification and Development of the Strayer-Haig Foundation Plan

Meek (1979:32) suggested that it was through Mort's efforts and modifications that the Strayer-Haig Minimum Foundation Plan came into

wide-spread use. Johns and Morphet (1975:212) noted that Mort, besides accepting the Strayer-Haig formula, also developed some concepts of his own.

Elements which Mort recommended in a minimum foundation plan are the following (Johns and Morphet, 1975:212):

(1) An educational activity found in most communities in the state was eligible for inclusion in the foundation program.

(2) Local factors over which a community has no control and which cause "unusual expenditures for meeting the general requirements" may be recognized for inclusion in the allocation of program grants.

(3) If unusual conditions in a district require more years of education, or program additions, or a more costly program in terms of the type of educational program offered, then these conditions may be recognized, and the additional costs compensated for in the equalization program.

Mort also developed the concept of the "weighted pupil" as a basis for establishing differential program costs of elementary and secondary education and for computing expenditure of a minimum satisfactory program (Meek, 1979:32). Further, Mort established the key district not as the wealthiest district as Strayer and Haig had done, but as the largest wealthy district, thereby avoiding the problem of using as the "key" (the basis for the equalization formula) school district one with an unusually high per pupil assessment (Atherton, Hanson, and Berlando, 1969:44).

Atherton, Hanson and Berlando (1969:44) stated that a further provision which Mort made in the foundation program was:

> . . . a degree of tax leeway in all except perhaps the very richest (district). . . . It was intended that by providing some measure of tax leeway, school districts would have the fiscal ability to provide an educational program beyond that of the minimum offering. Thus this provision would provide for the meaningful exercise of local autonomy while at the

same time a flow of support aimed at providing a basic standard of education.

While this last provision provides a greater measure of local autonomy, "local leeway" is in essence a disequalizing factor. Cohn (1974:18) suggested that the leeway was to encourage innovation in education at the local level; if the innovation turned out to be popular and effective, it might be included in the foundation program. It is noteworthy that as a further incentive for local initiative, Mort later developed a "percentage-equalizing" system (Meek, 1979:33).

EDUCATIONAL FUNDING ARRANGEMENTS IN ALBERTA

Many of the features of the Strayer-Haig-Mort foundation program are to be found in the 1961 Alberta School Foundation Program and in its revised forms (1970 and 1973). A description of the general features of the funding structure by major revenue sources for education is presented in the following paragraphs.

The basic purpose of the School Foundation Program Fund was ". . . to provide every school district with sufficient funds, regardless of its fiscal capacity, to achieve a minimum defined standard of education" (Hanson, 1971:7). Prior to implementation of the SFPF in 1961, local taxation was the primary revenue source for education, although Hanson (1971:34) noted that the province had allocated operational grants beginning in 1906. In addition, the province had offered stimulation grants for consolidation, for program additions, and for inter-district revenue equalization in the years 1953 to 1955. Thus at the outset, the aim of the provincial finance plan was the equalization of educational opportunity (fiscal and program equalization).

The School Foundation Program Fund in Alberta was created through a province-wide levy on the equalized assessment of all municipalities in the province. The levy was at a fixed rate for all municipalities, initially set at 32 mills in 1961. The total fund was distributed to the school districts ". . . according to an elaborate set of regulations, based mainly on definitions of basic programs" (Hanson, 1971:7). The province also contributed to the SFPF out of the general revenues. The provincial contribution to the SFPF from the general revenues in 1961 amounted to approximately 46.27% of the operational revenues of the school boards in Alberta.

The second major source of revenue for education in Alberta was from grants allocated under the provisions of the Alberta School Grants Regulations (Alberta Education Grants Order). A workshop package prepared for trustees (Alberta School Trustees' Association, 1978:16) included the following statement of purposes for the grants in general:

> These grants have been established in response to a variety of needs which cannot be met under the uniform grants paid from the School Foundation Program Fund. For example, the Small School Assistance Grant was established to help offset operating costs which, on a per pupil basis, are higher in a small school than in a large school. . . . Other grants, such as the Educational Opportunities Fund and the Special Education Grant, assist boards in providing programs for handicapped and disadvantaged children.

The Tables 1 and 2 following include data which indicate the increasing importance of the Alberta Education Grants Order allocations in the years 1969 to 1981.

In addition, the funding arrangement made provision for the levying of a Supplementary Requisition by any district which wished to provide a greater breadth of program, new programs, or improvements in the district's education beyond the basic program funded by the SFPF. Hanson

Table 1

Provincial-Local Operating Revenues by Major Source, Total Operating Revenues and Total Expenditures of Alberta School Boards: 1969-1981*
(in Millions of Dollars)

Year	Provincial Contribution to S.F.P.F.	Municipal Contribution to S.F.P.F.	Total S.F.P.F.	Alberta School Grants Order	Total Provincial Support	Supplementary Requisition	Total Operating Revenues	Total Operating Expenditures
1969	148.8	84.4	233.2	6.1	239.3	51.0	302.0	300.6
1970	184.8	95.8	280.6	8.8	289.4	38.8	340.2	336.9
1971	200.3	102.6	302.9	10.0	312.9	42.8	370.1	369.8
1972	211.7	109.1	320.8	13.7	333.7	50.3	401.2	401.3
1973	225.6	117.8	343.3	18.7	362.0	56.2	436.3	436.2
1974	305.6	64.0	369.6	28.7	398.3	74.0	491.6	493.8
1975	368.2	53.7	421.9	61.9	483.8	107.0	614.5	611.9
1976	411.2	57.5	468.7	58.0	526.7	130.3	685.8	690.2
1977	448.0	67.8	515.9	63.9	579.8	161.2	777.6	771.2
1978	474.0	77.1	551.1	73.2	624.3	192.1	855.7	850.1
1979	501.2	91.3	592.5	86.8	679.3	232.6	959.2	957.7
1980	528.0	103.7	631.7	109.0	740.7	281.4	1,076.7	1,069.5
1981	615.1	123.9	738.9	135.0	873.9	368.7	1,308.2	1,311.0

* Sources: Statistical Supplements to the Annual Report, 1970-1980. 1981 Data from Alberta Education. Excluding D.N.D. and Lloydminster Districts.

Total Operating Revenues include sources of revenue noted in Table 2.

Table 2

Alberta Education Grants and Supplementary Requisitions as Percentages of Total Operational Revenues, 1969-1981*

	(1)	(2)	(3)	(4)	(5)
Year	S.F.P.F.	Alberta Education School Grants Order	Total Provincial (1) + (2)	Supplementary Requisition	Other**
1969	77.2	2.0	79.3	16.9	3.9
1970	82.5	2.6	85.1	11.4	3.5
1971	81.8	2.7	84.6	11.6	3.9
1972	80.0	3.4	83.4	12.6	4.1
1973	78.7	4.3	83.0	12.9	4.1
1974	75.2	5.8	81.0	15.1	3.9
1975	68.7	10.1	78.7	17.4	3.9
1976	68.3	8.5	76.8	19.0	4.2
1977	66.3	8.2	74.6	20.7	4.7
1978	64.4	8.6	73.0	22.5	4.6
1979	61.8	9.1	70.8	24.3	4.9
1980	58.7	10.1	68.8	26.1	5.1
1981	56.5	10.3	66.8	28.2	5.0

Note: Total per cent figure may not equal 100 because of rounding.

* Source: same as Figure 1. D.N.D. and Lloydminster Districts are excluded.

** Other revenue sources include: Federal Government, Alberta Municipalities, Alberta School Authorities, Out of Province Local Governments, Private Organizations and Individuals, Transfers, and Cafeteria Services.

(1969:8) suggested that the Supplementary Requisition was initially perceived as enabling high assessment districts ". . . to serve as 'light house' districts. . . . At first it was envisaged that the supplementary requisitions would be modest in amount." In practice, however, the Supplementary Requisition accounted for 5.4 per cent of the total operating revenue of the elementary and secondary schools in Alberta in 1961; by 1978, the Supplementary Requisitions accounted for 20.7 per cent of the total revenue (Hanson, 1979:68).

PROVINCIAL-LOCAL COST SHARING: CHANGES IN THE EDUCATION FUNDING STRUCTURE

Between 1961 and 1970, the funding arrangements underwent only minor changes, aside from the annual upward revision of revenue inputs to meet the steadily rising expenditure brought about by increasing enrolments and rising costs. At the outset, allocations to the districts under the SFPF had been based on a combination of a per pupil grant and a per teacher grant which varied according to training of each teacher. Hanson (1976:25) noted that by 1963 ". . . the per pupil grants for maintenance of school plant and for instructional aids and materials ($1,000 and $300 per pupil) had been dropped, and the per pupil grants were increased and differentiated . . ." by grade level (I-VI; VII-IX; X-XII), reflecting the increased costs of educating junior high and high school students.

During the first nine years of operation, Hanson (1971) noted that the SFPF created a considerable degree of equalization of revenue among the school districts, ". . . but did not achieve anything near equity of standards" (Hanson, 1971:81). The sharply rising costs, however, par-

ticularly in the years 1965 to 1969, required increasing amounts of provincial contribution to compensate for the increasing disparity between local revenues and total expenditures. In addition, Hanson (1971:81) noted that ". . . the use of large supplementary requisitions . . . especially by the large school districts and by the strongest units generally, created considerable inequalities of standards." Accordingly, the SFPF was revised in 1970.

The most significant feature of the revision directly related to the supplementary requisition was the regulation limiting increases in the supplementary school requisition. The Requisition Limit Regulation under The School Act allowed an escalation, in either dollars or a mill rate, in each year. As the Minister's Advisory Committee on School Finance (1975:14) noted, boards wishing ". . . to requisition beyond the allowed limit (flexibility factor) in the 1970 plan were required to go to plebiscite." The report also noted that of the four plebiscites held in the years 1970 to 1972, all were defeated. Hanson (1976:27) referred to the three year period 1970 to 1972 as:

> . . . one of many restrictions on the expenditures of school boards, and much controversy and administrative uncertainty as to the amounts of provincial government grants to school districts. The situation was compounded by the election of a new provincial government . . . in August 1971.

In 1973, the plebiscite as a mechanism for increasing supplementary requisitions was dropped. In its place, there was (Hanson, 1976:28-29)

> . . . a provision which permitted a school board to pass a by-law which expressed the intent to levy a stated amount of supplementary requisition in excess of the basic allowable requisition multiplied by the allowable escalation factor (7.5 per cent for 1973, 1974, and initially, 1975).

The Minister's Advisory Committee on School Finance (1975:14) noted that

". . . twenty such by-laws were passed, and none were challenged."

Provision was also made in the 1973 regulations for school boards to request a budget review for the year 1973 for the purposes of adjusting the supplementary requisition upward. Of the forty-eight school jurisdictions requesting such a review, forty-seven of the reviews resulted in upward adjustments. (The Minister's Advisory Committee on School Finance, 1975:14). Thus, supplementary requisitions continued to increase in significance as a source of revenue (see Tables 1 and 2).

The revenue amounts in Table 1 are indicative of the increases. Total provincial support has grown from $239.3 millions in 1969 to an estimated $869.5 millions in 1981, an increase of approximately 263 per cent. The supplementary requisition, on the other hand, has increased from $51.0 millions in 1969 to an estimated $368.1 millions in 1981, an increase of approximately 622%. The increases in the supplementary requisition as a percentage of total revenue (Table 2) is further substantiation of the increasing significance of the supplementary requisition. The supplementary requisition comprised approximately 16.9 per cent of total operational revenues for education in 1969; by 1976, 19.0 per cent; and by 1981, an estimated 28.2 per cent.

Atherton (1979:5-6) suggested that one reason for the increase in the supplementary requisitions as a percentage of total revenue may have been a consensus reached at a meeting of the finance ministers of the Canadian Provinces in Edmonton in 1973. The finance ministers apparently:

> . . . agreed that Provincial Government fiscal transfers to local governments and social service agencies would grow at the same rate as provincial budgetary revenue. The base year chosen was fiscal year 1973-74.

Atherton further noted that:

> . . . the 'Edmonton commitment' has had the effect of restricting growth in provincial grants and shifting more of the burden of meeting inflationary increases to the local property tax.

At the same time, the reduction of the municipal contribution to the SFPF began in 1974 with the exemption of all residential property from the levy and continued with the exemption of all farm land (Hanson, 1976:30). The substantial increase in supplementary requisitions which followed (The Provincial Municipal Finance Council Report, 1979:341-342) made equalization of local taxation necessary. A requisition equalization grant (SREG) was introduced in 1975 as an attempt to make requisitions among boards more equitable and to provide an incentive to keep requisitions as low as possible (Hanson, 1976:36).

The first direct attempt at implementing a grant to offset wealth differences among school jurisdictions is an amendment (assented to April 8, 1926) to The School Grants Act. Equalization aid was allocated to districts on the basis of assessment per teacher. Under the Regulations Relating to the Payment of Grants, (section 4) (Order in Council No. 882-46), pursuant to The School Grants Act, 1945, the grant was allocated on the basis of assessment per classroom (Class Room Unit or CRU), the size or number of pupils per classroom varying according to the actual number of rooms plus additional room allowances for varying pupil transportation distances, administration, and vocational teachers not otherwise included. Hanson (1971:6) suggested that a precedent for SREG was a tax reduction subsidy grant introduced in 1955 and subsequently repealed in 1958, but the basing of the equalization upon assessment per unit of cost suggests the strong possibility that the earlier grants are the conceptual points of origin.

An even more recognizable form of the requisition equalization grant (SREG) appears to have had its origins in a position paper presented by Hanson and Atherton (1971) to the Commission on Educational Planning. In the following quotation from the paper, Hanson and Atherton presented two alternative local school taxation equalization plans and a rationale for equalizing local ability and effort:

> In order to encourage local administrative areas to provide services beyond the minimum level, and to preserve local governments, a system of cost sharing could be introduced. Two alternate schemes might be suggested. The first might be a percentage equalizing system whereby the percentage of support from the provincial government would vary inversely with local ability to pay as measured by assessment per pupil. A second alternative might be to adopt a variation of the Wisconsin approach and to guarantee each school district a minimum assessment per pupil.

The first alternative, the percentage equalizing grant, appeared to have been accepted by the Commission, for the Report (Worth, 1972:293) recommended a percentage equalizing grant as a means of alleviating interdistrict disparities in wealth. The Supplementary Requisition Equalization Grant (SREG) introduced in 1975 appeared to be an attempt to implement the intent of the recommendation.

The Supplementary Requisition Equalization Grant (SREG) was a form of a percentage-equalizing grant designed to achieve a greater degree of equalization of locally-raised per resident pupil revenues at a given mill rate. In effect, it provided a guaranteed per pupil assessment at a given mill rate and to the extent that mill rates are equivalent, it may be considered to be "power equalizing." Jefferson (1980:8) stated that the intent of SREG was ". . . to guarantee each board a minimum level of support for each resident pupil based on a given per pupil assessment and a net mill rate." In the 1979 Regulations, the provin-

cial support level was set at a maximum of $257.40 per resident pupil at a net mill rate of 14.3, yielding an effective per resident pupil assessment of approximately $18,000 for the year 1978. The grant is lagged in order for the necessary data to be collected. Also included was a provision (a "save harmless" or "grandfather" provision) that the amount of the SREG grant payable should not be less than 80% of the grant to a board in the previous year.

SUMMARY

A brief review of some of the major concepts in education finance were presented in this chapter. The necessity for equality of educational access was explored and defined. Further, the necessity for some degree of local control of education was also presented. Then a funding model, the Minimum Foundation Program, was briefly sketched as an example of a provincial local cost-sharing system for financing education.

The Alberta School Foundation Program Fund and the rest of the provincial-local education finance system were briefly described and shifts in the provincial and local shares in the funding of education were summarized.

Also, the increase in the importance of local taxation as a revenue source for education was explored in this chapter. The increase in the local tax burden for education, the necessity for a larger degree of local control of education, and the need to achieve a greater degree of fiscal equalization were described as the basic rationale for a local taxation equalization grant.

Finally, the antecedents of the requisition equalization grant (SREG) were described, and the major features of the SREG were presented. The SREG formulation and the operational effects of the grant will be more thoroughly described in subsequent chapters.

CHAPTER III

THE DESIGN OF THE STUDY

A brief review of the purposes of the study and descriptions of the population (school jurisdictions) under study, the sources of the data, the supplementary requisition equalization grant (SREG) formulation, and a percentage-equalizing alternative to the SREG formulation are to be found in this chapter. In addition, a description of the treatment of the data for each research question and an explanation of statistical techniques employed in the study are presented.

THE PURPOSE OF THE STUDY

The purposes of the study were first, to test the degree of wealth and effort resulting from the supplementary requisition equalization grant; and second, to determine if a greater or lesser degree of fiscal equalization might have been achieved if an alternative (percentage-equalizing) grant formulation had been used in place of the SREG.

THE RESEARCH SUB-PROBLEMS

The purposes of the study were re-formulated in the following questions for research:

1. Fiscal Equalization: The SREG Formulation

   1.1 To what extent was equalization of wealth among Alberta school

jurisdictions achieved through the supplementary requisition equalization grant?

1.2 To what extent would equalization of wealth have been enhanced if the "grandfather" or save harmless provision had been absent from the SREG formulation?

1.3 To what extent was equalization of effort for required local taxation achieved among Alberta school jurisdictions through the supplementary requisition equalization grant?

1.4 To what extent would equalization of effort for local taxation have been enhanced if the "grandfather" or save harmless provision had been removed from the SREG formulation?

2. Fiscal Equalization: A Percentage-Equalizing Formulation

2.1 Would a percentage-equalizing grant formulation have achieved a greater or lesser degree of wealth equalization among Alberta school jurisdictions if it had been used in place of the SREG?

2.2 Would a percentage-equalizing grant formulation have achieved a greater or lesser degree of equalization of effort for required local taxation among Alberta school jurisdictions if it had been used in place of the SREG formulation?

THE POPULATION

The population for the study was comprised of all operating school divisions, counties, public school districts, and separate school districts for 1979. Those districts which did not operate schools or for which data were not readily available (e.g., Lloydminster Public School

District and Lloydminster Roman Catholic Separate School District) were excluded from the study, as were Department of National Defense Schools.

For the purposes of comparative analyses of the effects of SREG and a percentage equalizing formulation, the jurisdictions were divided into the following categories:

1. Large Urban

   Calgary Public School District

   Calgary Roman Catholic Separate School District

   Edmonton Public School District

   Edmonton Separate School District

2. Other Urban

   St. Albert, Camrose, Fort McMurray, Grande Prairie, Lethbridge, Medicine Hat, Red Deer, Wetaskiwin Public and Separate school districts, and Drumheller Separate.

3. Total Urban

   All school jurisdictions with the exception of counties and school divisions.

4. Rural

   a. All school divisions.

   b. All counties.

5. Separate School Districts

   All jurisdictions so designated.

6. Other School Jurisdictions

   Barons Consolidated School District

   Lousana Consolidated School District

   Fahler Consolidated School District

   Thibault Catholic Public School District

Glen Avon Protestant Separate School District

St. Albert Protestant Separate School District

7. Public School Jurisdictions

All school jurisdictions with the exception of those included in (4), (5) and (6).

8. Total Population

All 136 jurisdictions included in the study.

A listing of jurisdictions is included in Appendix A.

SOURCES OF THE DATA

The data for the study were obtained from the Financial and Statistical Report of Alberta School Boards for 1978 and 1979 and from information provided by personnel in Alberta Education. Data obtained from the Financial and Statistical Report of Alberta School Boards for 1978 and 1979 included equalized assessments, School Foundation Program Fund (SFPF) allocations, supplementary requisition revenue, expenditures, and equalized mill rates. Data obtained from Alberta Education also included the electric power and pipeline tax revenue share, if any, for each jurisdiction, resident pupil enrolments, and the amount of the requisition equalization grant to each jurisdiction which received it in 1978. These data are summarized in Appendix B.

THE 1979 AND 1980 SUPPLEMENTARY REQUISITION EQUALIZATION GRANT FORMULAE

As noted previously, the Supplementary Requisition Equalization Grant (SREG) appears to have been implemented in order to provide a "floor" or minimum per pupil local taxation yield in each jurisdiction. In effect, the formulae provided the revenue per resident pupil which a

school jurisdiction would have been able to raise (the supplementary requisition) if the jurisdiction had a total assessment per pupil in 1978 of $18,042 for divisions and counties and $21,000 for jurisdictions other than counties or divisions. The guaranteed per pupil yield (combined per pupil revenue from the supplementary requisition and SREG), however, was conditional upon a jurisdiction's making an acceptable effort, i.e., a net mill rate of 14.3 mills or greater in 1978. If the net mill rate was less, the amount of the grant was pro-rated. The effects of the pro-rating upon per pupil yield become evident in the illustrations which will be presented subsequently.

Variables within the grant formulation include electric power and pipeline tax revenue share, equalized assessment, and resident pupil counts. Because the foregoing information is not complete until some time after the end of the fiscal year, the grant is lagged one year. Thus, the SREG formulation which was adopted in the Alberta School Grants Regulations in 1979 was applied to 1978 pupil counts, equalized assessments, and revenues; correspondingly, the 1980 formulation was applied to 1979 data.

The 1979 SREG formulation was used for illustration because it is less complex than the 1980 formulae. The 1979 SREG formulation (Regulations Under the Department of Education Act, School Grants Regulations, 1979:39) was as follows:

PART XII

(Requisition Equalization Grant)

48 In this Part,

(a) "e" means the number of resident pupils under the jurisdiction of a board in 1978;

(b) "f" means a board's total 1978 share, if any, of electric power and pipeline tax collected in counties, municipal districts, improvement districts or special areas pursuant to section 93(5) of the Municipal Taxation Act, and used in determining that board's requisition upon each municipality;

(c) "g" means the 1978 total requisition of a board under section 120 of The School Act;

(d) "h" means the 1978 equalized assessment for a district, division or county determined under section 117 of The School Act;

(e) net mill rate or "i" means the number calculated in accordance with the following formula:

$$i = \frac{g - f}{h} \times 1{,}000$$

49 (1) A requisition equalization grant equivalent to the amount determined under section 50 may be paid for 1979 to a board qualifying therefor.

(2) Notwithstanding subsection (1), where a school district, school division or county came into existence on or after January 1, 1978 the Deputy Minister, subject to such terms and conditions as he may prescribe, may order that the amount of grant payable under section 50 shall be reduced in proportion to the number of months during 1978 that the school district or school division was not in existence.

50 (1) The amount of a grant payable

(a) to a board which has a net mill rate of 14.3 mills or greater, shall be the amount determined in accordance with the following formula:

$$[\$257.40 \times (e)] - \frac{143}{10{,}000} \times \frac{[(h) + (f) \times 1{,}000]}{(i)}$$

(b) to a board which has a net mill rate of less than 14.3 mills, shall be the amount determined in accordance with the following formula:

$$\frac{[10 \times (i) \times \$257.40 \times (e)]}{143} - \frac{(i)}{10{,}000} \times \frac{[(h) + (f) \times 1{,}000]}{(i)}$$

(2) Notwithstanding subsection (1), where the formula results in a negative figure, no grant shall be paid.

(3) Notwithstanding sections 48 and 49 the Minister may require that amounts under this section in respect of any district, division or county be adjusted to conform with boundaries in effect in 1979.

(4) Notwithstanding subsections (1) and (2) the amount of grant payable to a board under this section shall not be less than 80% of the grant paid to the board under section 50 of the Alberta Education Grants Order, 1978.

For purposes of showing the effects of the SREG formulation in various situations, four hypothetical school jurisdictions with the following relevant characteristics are assumed:

	District A	District B	District C	District D
A. Resident Pupils	2,000	2,000	2,000	2,000
B. Electric Power and Pipeline Tax Revenue ($)	25,000	25,000	150,000	0
C. Total Supplementary Requisition ($)	510,000	246,000	390,000	390,000
D. Equalized Assessment ($)	20,500,000	20,500,000	20,500,000	20,500,000
E. Net Mill Rate $\frac{(C - B \times 1{,}000)}{D}$	23.66	10.78	11.71	19.02

Comparing the grant received by District A to that received by District B will serve to illustrate the effects of a net mill rate lower than the mill rate in the formulation. Under the grant formula, District A would receive a grant of $206,540 or $103.27 per resident pupil. The supplementary requisition provided $255 per pupil. The

total per pupil yield was then $358.27. District B would receive a grant of $142,090 ($71.05 per pupil). The additional per pupil yield of $123.00 from the supplementary requisition ($246,000) resulted in a total per pupil yield of $194.05, which is equivalent to $257.40 X $\frac{10.78}{14.3}$.

The guaranteed yield is thus pro-rated on the basis of a specified level of effort.

While it is evident from the foregoing comparison that the formulation does not equalize effort, or taxation rates, on the equalized assessment, it can be shown that the SREG formulation does establish an equivalent per pupil assessment or wealth base for both districts. If an assessment is imputed to the grant by dividing the grant by the net mill rate specified in the formula for District A, then the imputed assessment of the grant was $206,540 divided by 14.3 (.0143) mills or $14,443,299. The imputed assessment of the electric power and pipeline (E.P. and P.L.) tax share at the level of effort (23.66 mills) amounted to $1,056,636. The total of imputed assessments plus the equalized assessment amounted to approximately $36,000,000, or $18,000 per pupil.

For District B, the imputed assessment of the grant was determined at the level of effort which the district was prepared to make (i.e., 10.78 mills). The imputed assessment of the grant, therefore, amounted to $13,180,891. The imputed assessment of the E.P. and P.L. tax revenue amounted to $2,319,109 at 10.78 mills. The total assessment, then, was $36,000,000, or $18,000 per pupil.

From the foregoing, it may be seen that although the SREG formulation was not aimed at the equalization of taxation effort, it appears to have provided equalization of per pupil assessments up to a

given level at least for the sample jurisdiction. That level was determined by the provincially-established grant formulation.

Comparison of Districts C and D illustrates the equalization effects of the grant formulation between rural and urban jurisdictions. The hypothetical District D is urban, and the electric power and pipeline assessment is included in the equalized assessment. For administrative reasons, E.P. and P.L. assessment in a rural municipality is taxed at a uniform rate for school tax purposes regardless of its location in terms of school districts within the municipality. Section 93 of the Municipal Taxation Act requires uniform taxation of the E.P. and P.L. assessment at the average rate for all school systems in the municipality. The tax share is determined by the percentage of total municipal assessment which each school jurisdiction assessment comprises. For example, if the equalized assessment of a school district within a municipality comprises forty per cent of the equalized assessment of the municipality, its E.P. and P.L. tax share is forty per cent of the E.P. and P.L. tax revenue collected by the municipality for education.

The hypothetical urban District D, then, would receive its E.P. and P.L. revenue within its requisition and within its equalized assessment. Under the formula, District D received $221,650 in SREG, resulting in a total supplementary requisition and SREG yield of $611,650 or $305.82 per pupil. If District D had taxed itself at 14.3 mills, it would have realized $293,150 from the supplementary requisition and $221,650 from the grant, or $514,800 in total yield. Per pupil yield at 14.3 mills was thus $257.40.

District C would have received $31,505 in grant, resulting in a total supplementary requisition and SREG yield of $210.75 per pupil. If

District C had taxed itself at 14.3 mills net, the supplementary requisition would have been $443,150, and the SREG would have been $71,650. The total yield would then have been $514,800 or $257.40 per pupil.

In summary, the foregoing illustrations show the "district power-equalizing" effects (the provision of a hypothetical assessment base via grants to provide a given tax yield per pupil at a given mill rate) of the SREG formulation. Each district received a guarantee of a provincially-determined local (supplementary requisition) tax yield provided that the district taxed itself at a minimum acceptable level determined by the provincial government. Further, the formulation adjusted or pro-rated lower levels of effort. For example, a district with a net mill rate of approximately 10.73 mills would be making an effort which represents 75 per cent of the level determined by the formulation. Thus the district would have received 75 per cent of the guaranteed grant yield per pupil.

The 1980 SREG formulation for determining the amount of the grant was split between rural and urban jurisdictions as well as between levels of effort above and below the specified mill rate. The resulting formulation was thus comprised of four formulae. The split or differentiation between rural (school divisions and counties) and urban jurisdictions was apparently an attempt to offset disparities in equalized assessments between rural and urban property. In 1980, a five-year reassessment was undertaken to bring rural equalized assessments (which were considered undervalued) into line with urban assessments. The 1980 grant formulation, then, simply reflected an effort to offset the existing assessment disparities. The 1980 SREG formulation to provide some

equalization of 1979 supplementary requisition yields was as follows (Government of Alberta, Regulations Under the Department of Education Act, School Grants Regulations, Alberta Regulation 171/76 amended, Section 46-48):

PART XII

(Requisition Equalization Grant)

46 In this Part,

(a) "e" means the number of resident pupils under the jurisdiction of a board in 1979;

(b) "f" means a board's total 1979 share, if any, of electric power and pipeline tax collected in counties, municipal districts, improvement districts or special areas pursuant to section 93(5) of the Municipal Taxation Act, and used in determining that board's requisition upon each municipality;

(c) "g" means the 1979 total requisition of a board under section 120 of The School Act;

(d) "h" means the 1979 equalized assessment for a district, division or county determined under section 117 of The School Act;

(e) net mill rate or "i" means the number calculated in accordance with the following formula:

$$i = \frac{g - f}{h} \times 1{,}000$$

47 (1) A requisition equalization grant equivalent to the amount determined under section 48 may be paid for 1980 to a board qualifying therefor.

(2) Notwithstanding subsection (1), where a school district, school division or county came into existence on or after January 1, 1979 the Deputy Minister, subject to such terms and conditions as he may prescribe, may order that the amount of grant payable under section 48 shall be reduced in proportion to the number of months during 1979 that the school district or school division was not in existence.

48 (1) The amount of a grant payable

(a) to a board of a division or county which has a net mill rate of 21.3 mills or greater, shall be the amount determined in accordance with the following formula:

$$[\$384.30 \times (e)] - \frac{213}{10{,}000} \times \frac{[(h) + (f) \times 1{,}000]}{(i)}$$

(b) to a board of a division or county which has a net mill rate of less than 21.3 mills, shall be the amount determined in accordance with the following formula:

$$\frac{[10 \times (i) \times \$384.30 \times (e)]}{213} - \frac{(i)}{10{,}000} \times \frac{[(h) + (f) \times 1{,}000]}{(i)}$$

(c) to a board other than a board of a division or county and which has a net mill rate of 18.3 mills or greater, shall be the amount determined in accordance with the following formula:

$$[\$384.30 \times (e)] - \frac{183}{10{,}000} \times \frac{[(h) + (f) \times 1{,}000]}{(i)}$$

(d) to a board other than a board of a division or county and which has a net mill rate of less than 18.3 mills, shall be the amount determined in accordance with the following formula:

$$\frac{[10 \times (i) \times \$384.30 \times (e)]}{183} - \frac{(i)}{10{,}000} \times \frac{[(h) + (f) \times 1{,}000]}{(i)}$$

(2) Notwithstanding subsection (1), where the formula results in a negative figure, no grant shall be paid.

(3) Notwithstanding sections 46 and 47 the Minister may require that amounts under this section in respect of any district, division or county be adjusted to conform with boundaries in effect in 1980.

(4) Notwithstanding subsections (1) and (2) the amount of grant payable to a board under this section shall not be less than 80% of the grant paid to the board under section 50 of the Alberta Education Grants Order, 1979.

LOCAL TAXATION EQUALIZATION: PERCENTAGE EQUALIZING

There are no essential differences between a percentage-equalizing and the SREG formulation in terms of final objectives. The SREG formulation, however, prorates grant support if the mill rate is below the specified level, and in its present form, it has a "save harmless" or "grandfather" provision. This provision in SREG is stated in the Regulations, section 48(4) above.

District power equalizing and the SREG formulae, as the previous examples have illustrated, guarantee a per pupil tax yield (in other words, provide an equivalent per pupil assessment) at a given level of effort. The level of support, however, is limited in order to avoid providing incentive for effort beyond an established level. The level of local tax effort is left to local discretion subject to the upper limit determined by regulation (page 31).

A percentage-equalizing approach, as Garms, Guthrie and Pierce (1978:193-199) have observed, is a special case of power equalizing. The development of a percentage-equalizing formulation requires several steps.

First, an aid ratio is determined for each district. The aid ratio (Garms, et al., 1978:193) is determined by means of a formula:

$$1 - \left(f \times \frac{y}{\bar{y}}\right) \text{ where:}$$

y is the assessment per pupil of the school jurisdiction;

$\bar{y}$ is the assessment per pupil of the province (state) as a whole;

f is the provincially-(state-)established scaling factor (usually set between 0 and 1).

If the scaling factor were fixed at .2, if the local per pupil assessment were $9,000, and if the provincial assessment per pupil were $18,000 (as in the SREG formulation presented earlier), then the aid ratio would be: $1 - (.2 \times \frac{9,000}{18,000}) = .90$.

That means that the province would provide 90 per cent of the budget of the school jurisdiction; the local taxpayers would be required to raise the remaining ten per cent. If the local per pupil assessment were $90,000, then the aid ratio would be zero ($1 - (.2 \times \frac{90,000}{18,000}) = 0$).

The second step in the development of the formulation is the application of the aid ratio to that portion of each jurisdiction's budget which is to be guaranteed by the state or provincial government. Following Garms, Guthrie and Pierce (1978:194-195) the formula is then:

$$A_i = [1 - (f \times \frac{yi}{\bar{y}})] E_i \text{ where:}$$

A_i = provincial aid to the ith jurisdiction;

f = the scaling factor;

y_i = the assessment per pupil of the school jurisdiction;

$\bar{y}$ = the assessment per pupil of the province as a whole;

E_i = the local tax yield or revenue per resident pupil of the ith jurisdiction which is to be guaranteed by the province.

Garms, Guthrie, and Pierce (1978:194) assume that the percentage equalizing formula which they present is a complete funding arrangement. Because in this study the percentage-equalizing formulation was considered as a replacement for the SREG formulation, further modifications were necessary for two main reasons.

First, the SREG arrangement was calculated on a per resident pupil basis. It was thus necessary to compute the percentage-equalizing alternative on the same basis in order to establish equivalence for comparison.

Second, the SREG formulation was designed to provide partial equalization for that portion of a jurisdiction's budget which was raised from the supplementary requisition. Therefore, it was necessary to determine the amount of the supplementary requisition-supported portion of each jurisdiction's budget to which a percentage-equalizing formulation would be applied.

Because the main concern of the study was fiscal equalization of wealth and effort for basic or essential educational services, it was considered necessary to arrive at an approximate measure of revenue requirements. Since it was assumed at the outset that provincial subventions were not sufficient in any given jurisdiction to meet the costs for provision of basic educational services, then a portion of the supplementary requisition in each jurisdiction was therefore required to offset basic costs.

Thus it was necessary to determine the "required" portion of the supplementary requisition. The required portion is hereinafter variously referred to as required local tax, required local taxation, or required local contribution.

Initially, it was thought that a measure of required local contribution could be determined by deducting all provincial, federal, and other "external" revenues from operating expenditures and assuming that the provincial average per pupil residual amount was a reasonable measure of required local per pupil expenditure (i.e., required local con-

tribution). The data available, however, were not sufficiently consistent or specific to inspire confidence or to render such an analysis defensible.

For this reason, it was assumed that the supplementary requisition with operating deficits added or operating surpluses deducted would provide a closer approximation of the amount which a jurisdiction would have been required to raise out of current local tax revenue to have paid for the jurisdiction's current annual expenditures. The amount of local revenue per pupil would then be the required local tax revenue divided by the number of resident pupils.

Having calculated the required local tax revenue per pupil, it was then assumed that the provincial average (mean) required local tax revenue per pupil was a reasonable measure of the minimum required local tax revenue per pupil necessary for the provision of basic (essential) educational services. Then because basic educational services are provincially mandated, it was assumed that provincial fiscal equalization assistance should be available to those jurisdictions unable to raise the minimum required local tax revenue per pupil at a reasonable level of taxation effort.

The final form of the percentage-equalizing alternative to SREG may then be rendered in the following form:

$$A_i = [1 - (f \times \frac{y_i}{\bar{y}})] \times (E_i) \times (P_i); \text{ where}$$

A_i = provincial equalization aid to the ith jurisdiction;

f = scaling factor;

y_i = the assessment per resident pupil of the ith school jurisdiction;

$\bar{y}$ = the assessment per resident pupil of the province as a whole;

E_i = the local tax yield per resident pupil of ith jurisdiction which is to be guaranteed by the province;

P_i = the number of resident pupils in the ith jurisdiction.

(The assessment includes an assessment imputed to the electric power and pipeline tax revenue in addition to the equalized assessment in rural jurisdictions.)

THE TREATMENT OF THE DATA

The research questions posed earlier in the chapter dealt with two aspects of fiscal equalization: equalization of wealth and equalization of effort. In order to provide a means of answering the research questions in terms of both wealth equalization and equalization of effort, the data were subjected to varying calculations. The specific means by which each question was researched are presented on a question by question basis as follows:

1.1 To what extent was equalization of wealth among Alberta school jurisdictions achieved through the supplementary requisition equalization grant?

Essentially the same method as the one employed in the illustrations earlier in the chapter was used. The total assessment of each jurisdiction (the equalized assessment plus the imputed assessment of the electric power and pipeline tax revenue share) was noted. Then the amount of the SREG was assigned an assessed valuation by dividing the amount of the grant by the lesser of the net mill rate of the jurisdiction or the net mill rate specified in the 1980 SREG formulae (18.3 mills urban; 21.3 mills rural). The imputed assessment of the grant

added to the total assessment, was divided by the resident pupil count in each jurisdiction.

Two sets of measures were then computed. The first set (A) was comprised of data measurements for per pupil assessments with the imputed assessments for the SREG included; the second set (B) was comprised of data measurements for per pupil assessments without the imputed assessments for SREG included. In each set, the mean, standard deviation, and coefficient of variation were calculated for the total population (136 jurisdictions), the rural (counties and divisions), the large urban jurisdictions, other city jurisdictions, Public School Districts, the Roman Catholic Separate School Districts, and Other jurisdictions. (See Appendix A for a listing of the jurisdictions.) Comparative analyses of the two sets was then conducted.

1.2 To what extent would equalization of wealth have been enhanced if the "grandfather" or save harmless provision had been absent from the SREG formulation?

The SREG formulation included a provision that a jurisdiction would receive 80 per cent of the previous year's grant even if it were not entitled to a grant under the formulation operant in a given year. The receipt of an equalization grant when no such grant is necessary to achieve greater equity is frequently disequalizing, as some of the literature reviewed emphasized.

A similar method to the procedure used in the question 1.1 was employed to provide an answer to this question. The SREG was reformulated: any jurisdiction receiving a grant under the save harmless provision was assigned a zero grant. A set of data measurements was computed for per pupil assessments with the imputed assessments for the

reformulated SREG included. The set was then compared to the set developed for question 1.1.

Equalization of Effort

Measures of effort or burden in property taxation are usually expressed as mill rates levied on the assessment or the value of real property upon which the tax is being levied. In order to measure the effects of the incidence of the grant upon mill rates, it was necessary to calculate the impact indirectly.

The initial development of procedures to test equalization of effort in this study was based on the assumption that for any given jurisdiction, grant revenue from SREG in any given year would be less than the net operating revenues (the supplementary requisition plus deficits or less surpluses). If that assumption had been correct, then it would have been possible to test the effects of the SREG revenue upon effort or mill rates through the following procedure for each jurisdiction:

1. Calculation of net operating revenue requirements.
2. Conversion of net operating revenues to a mill rate on the equalized assessment.
3. Subtraction of SREG revenue from net operating revenue.
4. Conversion of the amount obtained in (3) to a mill rate on the equalized assessment.
5. Steps (3) and (4) repeated substituting an hypothetical SREG formulation excluding revenue received through the 80 per cent provision, thus generating a third mill rate.

6. Comparative analyses of the mill rate data obtained by steps (1) through (5) above.

The foregoing procedure, however, was found to be impossible because it was based on a faulty assumption. On the basis of available data, it was found that some jurisdictions in the study had net operating revenues which were less than SREG revenue received or of zero order.

Solutions to this procedural difficulty required abandonment of the procedure, for it is difficult to work with a negative or an extremely low mill rate on a conceptual level and in any event a negative mill rate would possibly distort or complicate calculation of means, standard deviations, and other measures.

An alternative way of viewing mill rates for net operating revenues is based on the assumption that the setting of mill rates for the supplementary requisition is based, obviously, on revenue requirements, but also the level of the mill rate is determined in part upon an estimation of prospective SREG revenue, and in the absence of the grant, it was assumed by the researcher for purposes of this calculation that the approximate amount of the grant would have likely been levied upon the equalized assessment.

The value of the grant may then be expressed as a mill rate by dividing the amount of the grant by the equalized assessment. Similarily, the value of support from an hypothetical SREG formulation with the 80 per cent provision eliminated can also be expressed as a mill rate.

In many respects, the expression of SREG revenue as a mill rate is similar to expression of SREG revenue as an assessment. In both cases, the grant revenue is an imputed value.

Assigning the grant revenue an imputed assessment or an imputed mill rate may be justified on the grounds that it translates the grant revenue from a per pupil yield or revenue to those related aspects which are being considered: assessments, or wealth, per pupil and mill rates, or effort, per pupil. Property tax yield is a function of the interaction between assessments and mill rates. Illustrating equalization effects of SREG upon revenue per pupil would therefore not really test wealth equalization and effort equalization separately. By converting the grant to mill rate equivalents or to assessment equivalents, it is possible to hold mill rates relatively constant while testing grant revenue effects upon assessments, and to hold assessments relatively constant while testing grant revenue effects upon mill rates. For the reasons noted in the preceding, the procedure used to test equalization effects was therefore adopted to examine the following questions related to effort.

1.3 To what extent was equalization of effort for required local taxation among Alberta school jurisdictions athieved through the supplementary requisition equalization grant?

An answer to the foregoing question required the following procedure:

A. The required local taxation for each jurisdiction was determined by the method described earlier in the chapter in relation to the percentage-equalizing formulation.

B. The mill rate necessary to raise the required local taxation in each jurisdiction was determined.

C. The revenue received through SREG was then added to the required local tax revenue, and a second mill rate was calculated by divid-

ing the total of the SREG and the required revenue by the assessment. This mill rate was used to measure the effect of the SREG in reducing the mill rate.

D. Sets of measurements of variation among the jurisdictions were computed for the two mill rates in the same format as was used in the previous research question.

E. Comparative analyses of the two sets were then undertaken.

1.4 To what extent would equalization of effort for required local taxation have been enhanced if the "grandfather" or save harmless provision had been removed from the SREG formulation?

For the same reasons presented in 1.3, the SREG was recalculated, and a mill rate for each jurisdiction was determined in the same way that the second mill rate was determined in 1.3. A set of data measurements were computed for the mill rate, and this set was compared to the sets computed for 1.3. Other comparative analyses were also undertaken.

Comparative Wealth Equalization

2.1 Would a percentage equalizing grant formulation have achieved a greater or lesser degree of wealth equalization if it had been used in place of the SREG in 1979?

The following procedures were undertaken in regard to the question:

A. An interactive computer program was used in order to establish percentage-equalizing allocations to jurisdictions which in aggregate amounted to approximately the same total provincial support to the jurisdictions as the 1980 SREG formulation provided. In this way the problem of higher levels of provincial support increasing the degree of equalization and distorting the comparison was avoided.

B. Once the hypothetical percentage-equalizing grants were determined for each jurisdiction, each grant was assigned an assessment on the basis of a mill rate which was the lesser of the net mill rate or the rate specified in the 1980 SREG formulation (21.3 mills for rural jurisdictions; 18.3 for urban). This imputed assessment was added to the total assessment of each jurisdiction, and the result was divided by the resident pupil enrolment of each jurisdiction.

C. A set of measurements was then computed and compared to the set computed for the SREG formulation in questions 1.1 and 1.2.

Comparative Equalization of Effort

2.2 Would a percentage equalizing grant formulation have achieved a greater or lesser degree of equalization of required local effort if it had been used in place of the SREG in 1979?

The percentage-equalizing allocation for each jurisdiction computed for 2.1 was assigned a mill rate and added to the basic mill rate as was done for listing the SREG formulations in conjunction with questions 1.3 and 1.4. A set of data measurements was then computed and compared to the SREG sets developed for questions 1.3 and 1.4.

The statistical measure of inequality used in the study was the coefficient of variation. The coefficient of variation is defined as the standard deviation divided by the mean: ". . . a standardized standard deviation" (Garms, et al., 1978:319-320). If jurisdiction assessments per pupil, for example, are assumed to be normally distributed, the coefficient of variation can be related directly to their distribution. Following Carroll (1979:29), a coefficient of .20 would mean that one one-sixth of the jurisdictions have assessments per pupil which are twenty per cent or more above the mean and about

one-sixth have assessments per pupil which are at least twenty per cent below the mean. If all jurisdictions had equal assessments per pupil, there would obviously be zero variation and a zero coefficient of variation.

The measure was used in this study for two reasons. First, it is widely used and relatively easily interpreted. Further, at the time of the study, Alberta was in the process of reassessing and redefining equalized assessments primarily to bring rural (farm) assessments which were considered undervalued to relative value parity with urban assessments. While it was necessary to assume an approximate undervaluation of fifteen per cent for rural assessments and adjust all calculations accordingly, it was considered more defensible to employ a measure of relative variation which enabled direct comparison of rural and urban assessment variation wherever possible.

SUMMARY

In this chapter, the design of the study and the procedures employed were presented. The population in this study was comprised of 136 Alberta school jurisdictions in the year 1979. The sources of the data were described. Two formulations, the SREG formulation and a Percentage-Equalizing formula were described in this chapter. The questions for research were reviewed, and the procedures used in considering each of the research questions was presented. In the various levels of wealth and effort equalization achieved, the coefficients of variation are used in the following chapter as a basis for comparing rural, urban, separate, public, large urban, and other groups among the jurisdictions.

CHAPTER IV

RESULTS OF THE ANALYSIS

This chapter contains the results of the analyses of the data and an explanation of the findings. The results of the analyses and the explanation of the findings will be presented for each of the major problems and sub-problems in the study.

FISCAL EQUALIZATION: SREG

The first major problem in the study concerned the extent or degree of fiscal equalization achieved under the SREG formulation. This first problem is examined, in its two related aspects: equalization of wealth, and equalization of effort.

1. Wealth Equalization: The SREG Formulation

In the first aspect, equalization of wealth achieved by the SREG formulation, the equalization effect of SREG was considered in two different forms: a hypothetical SREG calculated without the "80 per cent provision" and the SREG as it is in the Alberta School Grants Order (A.E.G.O., 1980). The SREG formulation in the A.E.G.O. includes a provision whereby a jurisdiction will receive no less under the grant regulations than 80 per cent of the grant allocated in the previous year. In operational terms, the two questions, which will be dealt with together, are these:

1.1 To what extent was equalization of wealth among Alberta school jurisdictions achieved through the supplementary requisition equalization grant?

1.2 To what extent would equalization of wealth have been enhanced if the "grandfather" or save harmless provision had been absent from the SREG formulation?

Findings

Examination of these two problems required analysis of the data presented in Table 3. The following data are presented for each jurisdiction group: mean per pupil assessments; mean per pupil assessments adjusted by or including imputed assessments for SREG revenue; and mean per pupil assessments including imputed assessments for SREG revenue which does not include revenue allocated under the 80 per cent provision. Also included are the standard deviation in per pupil assessments in each group and the coefficients of variation. Specific assessment data for each jurisdiction included in the study are presented in Appendix C.

Columns (2) and (3) in Table 3 are comprised of data related to adjusted equalized assessments per pupil including in each an imputed assessment for SREG for those jurisdictions receiving it. Measures of variation and other statistical data in column (2) are based on an adjusted equalized assessment in each jurisdiction, an adjusted assessment which includes an imputed assessment for SREG received under the regulations including the "80 per cent grant"; in column (3) calculations and data are based on an imputed assessment for the grant as it would have been excluding the "80 per cent provision".

The data presented in Table 3 indicate that variation in per pupil assessments among jurisdictions was generally slightly lower both within

Table 3

Wealth Equalization: Assessments Per Pupil and Assessments Per Pupil Adjusted to Include SREG Revenue

	(1) Equalized Assessment Per Pupil	(2) Per Pupil Equalized Assessment Plus Assessment For S.R.E.G.	(3) Per Pupil Equalized Assessment Plus Assessment For S.R.E.G. Excluding Revenue From 80% Provision
Rural			
Mean Per Pupil Assessment	$ 17,355	$ 20,333*	$ 20,116*
Standard Deviation	6,476	4,550	4,579
Coefficient of Variation	0.373	0.224	0.228
Large Urban			
Mean Per Pupil Assessment	$ 26,465	$ 27,077	$ 26,984
Standard Deviation	4,724	3,645	3,741
Coefficient of Variation	0.178	0.135	0.139
Other Major Urban			
Mean Per Pupil Assessment	$ 19,518	$ 22,932	$ 22,504
Standard Deviation	6,048	3,897	3,861
Coefficient of Variation	0.310	0.170	0.172
Total Urban			
Mean Per Pupil Assessment	$ 24,439	$ 26,103	$ 25,955
Standard Deviation	7,120	5,026	5,108
Coefficient of Variation	0.291	0.193	0.197
Public Districts			
Mean Per Pupil Assessment	$ 27,143	$ 27,724	$ 27,666
Standard Deviation	5,969	5,009	5,063
Coefficient of Variation	0.220	0.181	0.183
R.C.S.S.D.'s			
Mean Per Pupil Assessment	$ 18,060	$ 22,147*	$ 21,735*
Standard Deviation	4,953	1,619	1,212
Coefficient of Variation	0.274	0.073	0.056
Other			
Mean Per Pupil Assessment	$ 13,662	$ 20,932*	$ 20,932*
Standard Deviation	1,597	815	815
Coefficient of Variation	0.117	0.039	0.039
Total Sample			
Mean Per Pupil Assessment	$ 21,761	$ 23,922*	$ 23,748*
Standard Deviation	7,693	5,601	5,672
Coefficient of Variation	0.354	0.234	0.239
Wtd. Mean Per Pupil Assessment	$ 19,620	$ 21,635*	$ 21,474*
Wtd. Standard Deviation	$ 6,500	$ 4,523	$ 4,585
Wtd. Coefficient of Variation	0.331	0.209	0.214

Note: The weighted means reflect an adjustment factor that has been applied to the urban assessments to bring them in line with the rural equalized assessment figures used in the province.

* Denotes that the mean assessment is significantly different from the corresponding mean assessment in column (1) based on a t-test with alpha = 0.05.

the jurisdiction type (group) and within the total sample if the imputed assessment of grant was calculated with the 80 per cent provision included. There was an opposite indication within the Other Major Urban group: the standard deviation was lower with exclusion of the 80 per cent provision (column 3, Table 3). The Roman Catholic separate school jurisdiction (R.C.S.S.D.) group also had less variation with the exclusion of the 80 per cent provision. It appears that the general trend, however, was toward greater rather than lesser equalization of per pupil assessments with the inclusion of the additional imputed assessments of the grant including allocations under the "80 per cent" provision of the regulation.

Because it was deemed desirable to determine whether the shift toward greater equalization of mean per pupil assessments was statistically significant, a t-test was applied to the mean per pupil assessment for each group and for the total sample. For each group, the mean equalized assessment per pupil was compared through the t-test to the mean per pupil equalized assessment to which an imputed assessment per pupil for SREG revenue had been added. The mean per pupil equalized assessment was then compared through use of the t-test to the mean per pupil equalized assessment to which an imputed assessment per pupil for SREG revenue had been added but excluding SREG revenue allocated under the 80 per cent provision. The results of the application of the t-tests to the mean per pupil assessments of the various groups are also indicated in Table 3.

Analysis of the data from the t-tests indicated that the SREG support did result in a statistically significant increase in the wealth or assessment per pupil for the Rural jurisdictions, the Roman Catholic

Separate School Districts (R.C.S.S.D.), Other jurisdictions (regional high school districts, consolidated school districts, and Protestant Separate school districts), and for the total sample.

Further t-tests between the mean per pupil assessments with the two different SREG imputed assessment configurations were conducted in groups having relatively greater differentials in standard deviations of assessments (columns (2) and (3), Table 3). No significant differences in mean per pupil assessments were found.

Discussion

Because the differences in means were significant and because the standard deviations indicated reduced variation, it was therefore concluded that for the jurisdiction types noted, the SREG support was equivalent to a significant equalization of wealth. In addition, the overall equalization effect of the grants was indicated in the lower coefficients of variation for mean assessments which had been adjusted to account for grant revenue. The closeness of the coefficients of variation (columns (2) and (3) of Table 3) also suggests that the effects of the revenues allocated through the 80 per cent provision are negligible for the jurisdictions in this sample. Further, the lower standard deviation for the total sample for assessment adjusted for the SREG revenue including the 80 per cent provision and a slightly lower coefficient of variation indicate that the 80 per cent provision may in fact result in a slightly greater degree of wealth equalization rather than less. This last observation, however, has very insubstantial and unreliable support: the slight equalization effect produced by the

operation of the 80 per cent provision may be applicable only to jurisdictions included in this sample for this year.

Overall, wealth equalization resulting from SREG appeared to have been increased considerably among the jurisdictions in the sample. Of sixty school divisions and counties in Alberta, 40 (66.7 per cent) received support from the grant in 1980; 37 (61.4 per cent) of these jurisdictions would have received the grant without the 80 per cent provision. In terms of wealth or assessment per pupil, the grant support was equivalent to increasing the assessment per pupil to $18,042 for 61.7 per cent of the rural jurisdictions. Of the 76 urban (city, town, village and hamlet) jurisdictions, 61 (80.2 per cent) received support under the grant; 58 (76.3 per cent) would have received the grant if the 80 per cent provision had been eliminated. Of the 136 Alberta school jurisdictions included in the study, 101 jurisdictions (74.3 per cent) received support from the grant.

2. Equalization of Effort: The SREG Formulation

The first major problem in the study was the determination of the relative extent or degree to which fiscal equalization was achieved under the SREG formulation. As noted previously, the problem has two related aspects: equalization of wealth, which has been considered in the previous section, and equalization of effort. As with the sub-problems on equalization of wealth achieved by the SREG formulation, SREG was again evaluated in two forms, the formulation including the 80 per cent provision (a "grandfather" clause) and a hypothetical formulation excluding the 80 per cent provision. In operational terms, the two

questions related to the effects of the SREG formulation upon the equalization of effort may be stated as follows:

1.3 To what extent was equalization of effort for required local taxation achieved among Alberta school jurisdictions through the supplementary requisition equalization grant?

1.4 To what extent would equalization of effort for local taxation have been enhanced if the "grandfather" or save harmless provision had been removed from the SREG formulation?

As noted in the previous chapter, in order to examine the effects of the SREG upon equalization of effort, it was assumed that the basic mill rate, which was a measure of effort to raise net revenue requirements (the supplementary requisition plus operating deficits or less operating surpluses), was also an indirect measure of the incidence of the grant, for if the grant revenue had not been available, then the mill rate would have had to have been higher. Put another way, the incidence of the grant was assumed to be a determining factor in the setting of local mill rates.

It should be noted that the setting of the local mill rate is a matter of estimation of revenue requirements and amounts and sources of revenue. It is a prospective mill rate, whereas the basic mill rate is a mill rate which should have been the rate to meet education expenditures to be supported by local taxation. The basic mill rate is thus retrospective in much the same way that the SREG is lagged.

Following the procedures set forth in the previous chapter, three mill rates for each jurisdiction were calculated. The first mill rate was the basic mill rate as described above, the second mill rate was the sum of the basic mill rate plus the mill rate represented by SREG revenue. The third mill rate was the sum of the basic mill rate plus

the mill rate represented by the incidence of SREG revenue without revenues allocated under the 80 per cent provision.

Mill rates and other data for each jurisdiction were presented in Appendix D. The data are summarized by jurisdiction type in Table 4.

Findings

Table 4 includes the following data related to equalization of effort (as measured by mill rate) for each jurisdiction type and the total sample: mean mill rate; standard deviation; and, coefficient of variation. Each of these three measures was calculated for mean required or basic mill rates, mean mill rates necessary to raise net revenue requirements plus the SREG revenue received, and mean mill rates required to raise net revenue requirements plus the SREG revenue but excluding grant revenue allocated under the 80 per cent provision.

The most obvious finding in Table 4 was the lower mean mill rates in column (1) in comparison with mean mill rates in columns (2) and (3). The differences between the mill rates in (2) and in (1) were approximations of the relief in mills or the mean abatement resulting from the incidence of SREG revenue for each jurisdiction group. The greatest reductions in mean mill rates were to be found in the Rural, R.C.S.S.D., and Other jurisdiction groups. The reduction or relief in mills was found to be 5.56 mills on the average for the Rural jurisdiction group, 6.21 mills on the average for the R.C.S.S.D. group, and 9.97 mills on the average for the Other jurisdiction group.

Differences were slight between mean mill rates in column (1) and column (3) and followed the same general pattern for all jurisdiction groups, except that differences in the means between columns (1) and

Table 4

Effort Equalization: Local Required Mill Rates and Hypothetical Mill Rates Adjusted to Include SREG Revenue

	(1) Basic Mill Rate	(2) Basic Mill Rate Plus Mill Rate Represented by S.R.E.G.	(3) Basic Mill Rate Plus Mill Rate Represented by S.R.E.G. Excluding 80% Revenue
Rural (n = 60)			
Mean Mill Rate	26.05	31.61*	31.37*
Standard Deviation	5.63	10.51	10.67
Coefficient of Variation	0.216	0.333	0.340
Large Urban (n = 4)			
Mean Mill Rate	26.61	27.26	27.19
Standard Deviation	.87	1.20	1.24
Coefficient of Variation	0.033	0.044	0.046
Other Major Urban (n = 17)			
Mean Mill Rate	28.99	33.61*	33.24
Standard Deviation	4.75	7.52	7.60
Coefficient of Variation	0.164	0.224	0.229
Total Urban (n = 76)			
Mean Mill Rate	26.94	29.30*	29.18*
Standard Deviation	3.64	7.22	7.21
Coefficient of Variation	0.135	0.246	0.247
Public Districts (n = 27)			
Mean Mill Rate	27.28	27.97	27.92
Standard Deviation	2.62	3.92	3.89
Coefficient of Variation	0.096	0.140	0.139
R.C.S.S.D.'s (n = 43)			
Mean Mill Rate	26.32	32.53*	32.19*
Standard Deviation	5.25	11.76	11.84
Coefficient of Variation	0.200	0.361	0.368
Other (n = 6)			
Mean Mill Rate	23.60	33.57*	33.57*
Standard Deviation	5.17	5.82	5.82
Coefficient of Variation	0.219	0.173	0.173
Total Sample (n = 136)			
Mean Mill Rate	26.60	33.57*	33.57*
Standard Deviation	5.17	5.82	5.82
Coefficient of Variation	0.219	0.173	0.173

* Denotes a significant difference between mean mill rate in column (2) or (3) in comparison to corresponding mean mill rate in column (1) on basis of tests (separate variance t-model) at alpha = 0.05.

(3) were the same or slightly less in each jurisdiction group than the differences between means in columns (1) and (2). The greatest average differences between means in columns (1) and (3) are 5.32 mills for the Rural jurisdiction group, 5.87 mills for the R.C.S.S.D. group, and 9.97 mills for the Other jurisdiction group. These average differences in mean mill rates between the basic mill rate and the basic mill rate adjusted to include SREG revenue but excluding "80 per cent provision revenue" (column (3)) represented the relief in mills which would result from the incidence of the grant revenue.

Differences were comparatively small in mean mill rates which represent mill rates to raise required revenue and SREG revenue including the 80 per cent provision revenue (column (2)) and excluding the 80 per cent provision revenue (column (3)). The differences between mean mill rates in these two columns in Table 4 represented the effects upon mean mill rates of the incidence of SREG revenue allocated under the 80 per cent provision.

It is evident from the data presented in Table 4 that the standard deviations and coefficients of variation were generally lower for the basic mill rates (column (1)) than for the mill rates which have been adjusted to account for SREG revenue or which have been adjusted to account for SREG revenue excluding revenue allocated under the 80 per cent provision (columns (2) and (3), respectively). An exception to the foregoing was the Other jurisdiction group.

For example, the standard deviation in mill rates for rural jurisdictions was 10.51 mills of both SREG revenue and the required revenue were raised on the local assessment (column (2)). The standard devia-

tion in basic mill rates, which implicitly reflect the incidence of the grant revenue, was 5.63 mills.

Comparison of the standard deviation figures for mill rates in each jurisdiction group in columns (2) and (3) indicated that standard deviations were slightly lower in column (2) than in column (3) with the exception standard deviations for the Total Urban and Public Districts jurisdiction groups. The differences, however, were slight, for the standard deviation figures in columns (2) and (3) are the same (at least to two decimal places).

To determine if the SREG support in either form had a statistically significant effect upon mill rates, the t-test was used to compare mean basic mill rates (column (1)) with mean mill rates adjusted to account for SREG revenue (column (2), Table 4) and to compare mean basic mill rates with mean mill rates adjusted to account for SREG revenue (with revenue from the 80 per cent provision excluded). Further t-tests were undertaken to test for significant differences in mean mill rates which were adjusted for SREG revenue including or excluding 80 per cent provision revenue. (Comparison of mean mill rates in columns (2) and (3), Table 4.) Significant differences in means are noted (*) in Table 4.

Significant differences were found between mean basic mill rates and mean mill rates adjusted to acount for SREG revenue for the following jurisdiction groups: Rural; Other Major Urban; R.C.S.S.D., Other; and, Total Sample. No significant differences in mean mill rates were found for the Large Urban or Public Districts groups.

Significant differences were also found between mean basic mill rates and mean mill rates adjusted to account for SREG revenue but excluding "80 per cent revenue". Jurisdiction groups in which signifi-

cant differences in mean mill rates were indicated by the t-tests included Rural, Total Urban, R.C.S.S.D., Other, and Total Sample. No significant differences in mean mill rates were found for the Large Urban, Public Districts, or Other Major Urban jurisdiction groups.

Differences in mean mill rates adjusted to account for revenue under the two SREG formulations (columns (2) and (3), Table 4) were found to be not significant statistically. This last finding was wholly predictable, given the differences in means for each jurisdiction group.

Discussion

The lower standard deviation figures for basic mill rates in each jurisdiction group (column (1), Table 4) in comparison to the mill rates in columns (2) and (3) suggested that the incidence of the grant in either formulation expressed as a mill rate on the equalized assessment resulted in a reduced variation of mill rates among jurisdictions generally and among jurisdiction types or groups. The respective coefficients of variation or average variation relative to the mean are also reduced with the exception of the Other jurisdiction group. This reduction implied that in the absence of grant support, the mill rates would have been not only higher in order to maintain approximately equivalent revenues per pupil, but also more varied from one jurisdiction to another.

An apparent disequalization was indicated by the increase in the coefficient of variation for the basic mill rate for the Other group over the coefficients of variation for mill rates which were adjusted for SREG revenue in either formulation. It appeared that the apparent disequalization as a result of the incidence of the grant was attribut-

able to the fact that one jurisdiction of the four which received SREG revenue received a pro-rated grant. The difference between the pro-rated and the full grant was approximately $16,540. This amount represented approximately 1.41 mills on the assessment of the jurisdiction, but another approximately 2.4 mills would have been required to raise the jurisdiction's net mill rate to the full SREG mill rate eligibility level (18.3 mills). The additional effort would probably have resulted in greater equalization or reduced variation of mill rates if the coefficient of variation was used as the measure.

On the basis of the generally lower standard deviations and lower coefficients of variation for basic mill rates in comparison to corresponding standard deviation figures and coefficients of variation for the mill rates adjusted to account for grant revenue, it was concluded that the incidence of the SREG revenue had tended to reduce variation in mill rates. Further, it was concluded that, with the exception of the Large Urban and Public Districts, the reduction in the mean mill rates and the reduction in variation of rates brought about through the incidence of the grant was statistically significant.

The hypothetical SREG formulation (the 80 per cent provision eliminated) did not appear to have the same level of equalizing effect as the regular SREG formulation. Comparison of coefficients of variation between columns (3) and (1) and columns (2) and (1) in Table 4 for each group indicated that for several groups the SREG formulation excluding the 80 per cent provision resulted in slightly larger variation of mill rates between jurisdictions in the group relative to the mean mill rate of the group than did the mill rate which accounted for the regular SREG revenue. The results of the *t*-tests, however, estab-

lished no significant differences between the mean mill rates accounting for the two SREG formulations.

FISCAL EQUALIZATION: PERCENTAGE EQUALIZING FORMULATION

The second major problem in the study concerned the relative degree of fiscal equalization (wealth equalization and effort equalization) achieved by a percentage-equalizing formulation in comparison with the SREG formulation. In operational terms, the second major problem was sub-divided into two questions which will be considered separately. The two questions are as follows:

2.1 Would a percentage-equalizing grant formulation have achieved a greater or lesser degree of wealth equalization among Alberta school jurisdictions if it had been used in place of the SREG?

2.2 Would a percentage-equalizing grant formulation have achieved a greater or lesser degree of effort equalization among Alberta school jurisdictions if it had been used in place of the SREG formulation?

Comparison of a percentage-equalizing formulation and the SREG formulation required the development of a percentage equalizing formulation which satisfied all of the following criteria:

1. Approximate equivalence of total grant revenue with the total grant revenue allocated through the SREG. Adherence to this criterion largely eliminated the possibility of a greater or lesser grant amount affecting the measures of equalization and so distorting the data and the interpretation of the results of the analysis.
2. Approximate equivalence of the proportions of the total revenue allocated to urban and rural jurisdictions by the percentage-equal-

izing formulation as were allocated under the regular SREG formulation.

3. Retention of the assumptions regarding the relative values of urban and rural assessments. The SREG formulation was based in part upon an implicit assumption of an approximate 15 per cent undervaluation of rural equalized assessments in 1979.

In order to satisfy the foregoing requirements, it was necessary to base the aid ratio on a provincial average assessment per pupil of $18,042 for rural jurisdictions and $21,000 for all other jurisdictions. These average assessments are implicit within the 1980 SREG formulation designed to provide support toward equalization of 1979 assessments, mill rates, and per pupil tax yields. Thus it was necessary also to set the per pupil revenue guaranteed by the grant at $384.30. The main parameters of the percentage-equalizing formulation are the average assessment, the amount of revenue guaranteed, and the *f* factor, which is mathematically the portion of the guaranteed per pupil revenue which will be supported by the province relative to the aid ratio. Thus to achieve comparability, the percentage-equalizing grant was developed along the same parameters as SREG. This formulation was used in comparison with SREG in order to consider the two questions noted previously.

1. Wealth Equalization

The percentage-equalizing grants calculated for all jurisdictions on the parameters noted were then converted to assessment values in the same way that the grant revenues from the SREG formulation were assigned imputed assessments. The per pupil assessments (equalized assessments

plus imputed assessments for the percentage-equalizing grant formulation) so obtained together with equalized assessments per pupil and per pupil equalized assessments including imputed assessments for SREG revenue are presented for each jurisdiction in Appendix C. The mean assessments indicated in the foregoing for each jurisdiction type, the respective standard deviations, and the coefficients of variation for a comparative analysis are presented in Table 5. The mean per pupil assessments which included an imputed assessment for SREG support calculated without "save harmless" revenue were presented in Table 5 (column 3) for comparison.

Findings

Analysis of the data presented in Table 5 indicated that mean assessments including an imputed assessment for SREG support but excluding 80 per cent revenue (column 3) more closely paralleled mean assessments including imputed assessment for percentage-equalizing support than did the other corresponding mean assessments.

Comparison of variation (standard deviation) in assessments per pupil in each jurisdiction group indicated that with the exceptions of the R.C.S.S.D., Other, and Total Sample, the standard deviation figures for the assessments adjusted by percentage-equalizing revenue were in between the assessment figures reflecting the imputed assessments of revenues from the two SREG formulations.

In terms of the standard deviation relative to the mean (the coefficient of variation), it was found that with the exception of the R.C.S.S.D., Other, and Total Sample, the coefficients of variation for the assessments adjusted by an imputed assessment for SREG revenue in

Table 5

Wealth Equalization: Assessments Per Pupil and Assessments Per Pupil Adjusted to Include Percentage-Equalizing Revenue

	(1) Equalized Assessment Per Pupil	(2) Equalized Assessment Per Pupil Plus Assessment For S.R.E.G.	(3) Equalized Assessment Per Pupil Plus Assessment For S.R.E.G. W/O 80%	(4) Equalized Assessment Per Pupil Plus Assessment For Percentage Equalizing
Rural (n = 60)				
Mean Per Pupil Assessment	$ 17,355	$ 20,333*	$ 20,116*	$ 20,130*
Standard Deviation	6,476	4,550	4,579	4,571
Coefficient of Variation	0.373	0.224	0.228	0.227
Large Urban (n = 4)				
Mean Per Pupil Assessment	$ 26,465	$ 27,077	$ 26,984	$ 26,984
Standard Deviation	4,724	3,645	3,741	3,741
Coefficient of Variation	0.178	0.135	0.139	0.139
Other Major Urban (n = 17)				
Mean Per Pupil Assessment	$ 19,518	$ 22,932	$ 22,504	$ 22,504
Standard Deviation	6,048	3,897	3,861	3,860
Coefficient of Variation	0.310	0.170	0.172	0.172
Total Urban (n = 76)				
Mean Per Pupil Assessment	$ 24,439	$ 26,103	$ 25,955	$ 25,972
Standard Deviation	7,120	5,026	5,108	5,085
Coefficient of Variation	0.291	0.193	0.197	0.196
Public Districts (n = 27)				
Mean Per Pupil Assessment	$ 27,143	$ 27,724	$ 27,666	$ 27,670
Standard Deviation	5,969	5,009	5,063	5,055
Coefficient of Variation	0.220	0.181	0.183	0.183
R.C.S.S.D.'s (n = 43)				
Mean Per Pupil Assessment	$ 18,060	$ 22,147*	$ 21,735*	$ 21,778*
Standard Deviation	4,953	1,619	1,212	1,134
Coefficient of Variation	0.274	0.073	0.056	0.052
Other (n = 6)				
Mean Per Pupil Assessment	$ 13,662	$ 20,932*	$ 20,932*	$ 21,070*
Standard Deviation	1,597	815	815	722
Coefficient of Variation	0.117	0.039	0.039	0.034
Total Sample (n = 136)				
Mean Per Pupil Assessment	$ 21,761	$ 23,922*	$ 23,748*	$ 23,764*
Standard Deviation	7,693	5,601	5,672	5,657
Coefficient of Variation	0.354	0.234	0.239	0.238
Wtd. Mean Per Pupil Assessment	$ 19,620	$ 21,635*	$ 21,474*	$ 21,623*
Wtd. Standard Deviation	$ 6,500	$ 4,523	$ 4,585	$ 6,049
Wtd. Coefficient of Variation	0.331	0.209	0.214	0.280

Note: The weighted means reflect an adjustment factor which has been applied to the urban assessments to bring them in line with the rural equalized assessment figures used in the province.

* Denotes that the assessment is significantly different from the corresponding mean assessment in column (1) based on a separate variance model t-test with alpha = 0.05.

each jurisdiction group (column 2) were lower. The coefficient of variation was lower for the Total Sample if the urban assessments were adjusted to bring them into line with the rural assessment figures which represented an approximate 15 per cent undervaluation in comparison to urban assessment figures.

A series of *t*-tests were employed to determine if significant differences in mean assessments could be found between equalized assessments per pupil and the mean assessments per pupil which included an imputed assessment for revenue for the percentage-equalizing formulation. Comparison of this last set of mean assessments was made to corresponding mean assessments, one set which was comprised of imputed assessments which accounted for the incidence of SREG revenue in its regular formulation and one set which accounted for the incidence of SREG revenue less revenue from the 80 per cent provision. Comparison of the "percentage-equalizing-adjusted assessments" with the "SREG-adjusted assessments" were found to be directly comparable with the results of the *t*-tests to assess comparative degrees of wealth equalization for the two SREG formulations. (See Table 3 or columns (2) and (3) of Table 5.)

The percentage-equalizing formulation, like the two SREG formulations, yielded differences in the means of per pupil assessments which were found to be statistically significant for the Rural, the R.C.S.S.D., and the Other jurisdiction groups as well as for the Total Sample.

For both the SREG and the percentage-equalizing formulation the shifts in mean assessments were accompanied by reduced variation in assessments per pupil among jurisdictions within each group in comparison to the equalized assessments per pupil (column (1)). There was also

reduced variation relative to the mean (as measured by the coefficient of variation) between corresponding coefficients of variation in column (1) and in column (2) and in column (1) and in column (4).

Further t-tests were also done in order to compare the relative wealth-equalizing potential of the percentage-equalizing formulation in place of the SREG formulation. The analysis, however, did not indicate significant differences in the wealth equalizing potential of the two formulations in comparison to each other.

Discussion

The indication from the analysis was that mean assessments which included the imputed assessment for SREG support excluding the 80 per cent revenue more closely paralleled mean assessments which included imputed assessments for the revenue from the percentage-equalizing formulation than did the other mean assessment. This finding merely reinforced the fact that mathematically SREG is a percentage-equalizing formulation with two special provisions: a provision which provides for the proration of revenue from the grant for those jurisdictions which have not made sufficient effort to qualify for the full grant; and, a provision which allows a jurisdiction to receive the greater of the amount calculated under the formula for the present year or 80 per cent of the grant allocated in the previous year. The differential effects of the percentage-equalizing and the "SREG without 80 per cent" formulations should be exactly the same for those jurisdiction types where no proration of SREG revenue has occurred.

Further analysis of the data for each jurisdiction and jurisdiction type revealed that no proration occurred in grants allocated to juris-

dictions in the Large Urban and the Other Major Urban groups. As a result, the two grant formulations achieved the same effects. (See Table 5, columns (3) and (4) for the appropriate jurisdiction groups.)

Where proration was most evident was in the R.C.S.S.D. and Other groups. The differentials in mean assessments, standard deviation, and coefficient of variation were greatest in these jurisdiction groups.

Because of the similarities between the effects of the SREG without the 80 per cent provision and the percentage-equalizing formulation upon assessments, the same conclusions were applicable here as were arrived at in the earlier section dealing with comparative wealth equalizing effects of the two SREG formulations.

The reduced standard deviations evident with the SREG and percentage-equalizing formulation and the statistical significance of the difference between mean per pupil equalized assessments and each of the three per assessments including an imputed assessment for revenue from one of the grant formulations suggested that generally any one of the three formulations had an equalizing effect upon wealth or assessment per pupil among all jurisdictions in the study as a group (Total Sample) and among jurisdiction types, specifically the Rural, R.C.S.S.D., and Other.

Further, it was concluded on the basis of the t-tests and the other measures on the mean assessments under the three grant formulations (columns (2), (3), and (4), Table 5) that there were no statistically significant differences between the three grant formulations.

If the foregoing conclusion is correct, then in effect the analysis of the data on wealth equalization has simply shown that neither the incidence of the "grandfather" clause in the SREG formulation nor the

proration of grants for lower than specified mill rates had a statistically significant effect upon equalization of wealth or assessment per pupil. While the percentage-equalizing formula appeared from the coefficients of variation to be slightly more effective than the SREG formulation in overall wealth equalization generally, the differences were not significant.

2. Equalization of Effort

Analysis of data to determine if a percentage-equalizing formulation would have achieved a greater degree of equalization of taxation effort or mill rate per pupil among Alberta school jurisdictions was based on data obtained from the same percentage-equalizing formulation described in the previous section.

The procedures for testing the comparative degree of equalization of effort achieved by the SREG and the percentage-equalizing formulations are the same procedure used to compare the regular and the hypothetical SREG (without the 80 per cent provision) formulations. The basic mill rate previously developed, and a second mill rate comprised of the basic mill rate plus the value in mills of SREG revenue received for a given jurisdiction were transferred from Table 4 to Table 6 for comparative purposes. A third mill rate, similar to the second mill rate but for the hypothetical SREG formulation excluding 80 per cent revenue, was also transferred to Table 6. Then a fourth mill rate comprised of the a basic mill rate plus the value in mills which a percentage-equalizing grant would represent on the assessment of a given jurisdiction was calculated. The various mill rates and other related data are included in Appendix D. The mean mill rates and corresponding

Table 6

Effort Equalization: Local Required Mill Rates and Hypothetical Mill Rates Adjusted to Include Percentage-Equalizing Revenue

	(1) Basic Mill Rate	(2) Basic Mill Rate Plus Mill Rate Representing S.R.E.G. Revenue	(3) Basic Mill Rate Plus Mill Rate Representing S.R.E.G. Revenue Excluding Revenue Under 80% Provision	(4) Basic Mill Rate Plus Mill Rate Representing Percentage-Equalizing Revenue
Rural (n = 60)				
Mean Mill Rate	26.05	31.61*	31.37*	31.39*
Standard Deviation	5.63	10.51	10.67	10.64
Coefficient of Variation	0.216	0.333	0.340	0.339
Large Urban (n = 4)				
Mean Mill Rate	26.61	27.26	27.19	27.19
Standard Deviation	.87	1.20	1.24	1.24
Coefficient of Variation	0.033	0.044	0.046	0.046
Other Major Urban (n = 17)				
Mean Mill Rate	28.99	33.61*	33.24	33.24
Standard Deviation	4.75	7.52	7.60	7.60
Coefficient of Variation	0.164	0.224	0.229	0.229
Total Urban (n = 76)				
Mean Mill Rate	26.94	29.30*	29.18*	29.24*
Standard Deviation	3.64	7.22	7.21	7.26
Coefficient of Variation	0.135	0.246	0.247	0.248
Public Districts (n = 27)				
Mean Mill Rate	27.28	27.97	27.92	27.94
Standard Deviation	2.62	3.92	3.89	3.91
Coefficient of Variation	0.096	0.140	0.139	0.140
R.C.S.S.D.'s (n = 43)				
Mean Mill Rate	26.32	32.53*	32.19*	32.37*
Standard Deviation	5.25	11.76	11.84	11.90
Coefficient of Variation	0.200	0.361	0.368	0.368
Other (n = 6)				
Mean Mill Rate	23.60	33.57*	33.57*	33.76*
Standard Deviation	5.17	5.82	5.82	5.48
Coefficient of Variation	0.219	0.173	0.173	0.162
Total Sample (n = 136)				
Mean Mill Rate	26.60	33.57*	33.57*	30.26*
Standard Deviation	5.17	5.82	5.82	8.93
Coefficient of Variation	0.219	0.173	0.173	0.295

* Denotes a significant difference between mean mill rate in column (2) or (3) in comparison to corresponding mean mill rate in column (1) on basis of t-tests (separate variance t-model) at alpha = 0.05.

standard deviation figures and coefficients of variation for each jurisdiction group, including the total sample.

Findings

It was evident from the data presented in Table 6 (columns (2) and (4)) that differences in the abatement effects of the two grants were slight. The mean mill rates including a mill rate for the percentage-equalizing revenue were found to correspond more closely to the mill rates including a mill rate for SREG revenue without 80 per cent revenue than to the second mill rate which included a value in mills for SREG revenue.

It was found that the two mill rates (columns (3) and (4), Table 6) representing the two grant configurations and the related data were exactly the same for the Large Urban and Other Major Urban jurisdiction groups.

Comparisons of data related to the mill rate representing SREG revenue (column (2)) with the mill rate representing percentage-equalizing revenue indicated that averge relief in mills was greater for the mill rate which accounted for the incidence of SREG revenue in all jurisdiction groups except Other. In the Other group, one of the jurisdictions received a prorated grant under the SREG regulations.

To determine if the incidence of SREG support and the incidence of the percentage-equalizing formulation revenue had resulted in statistically significant differences in the mean mill rates (columns (3) and (4), Table 6) for each jurisdiction group, the mean mill rates were subjected to *t*-tests. No significant differences in the corresponding mean mill rates for each jurisdiction group were found.

Significant differences were found between mean basic mill rates (column (1)) and mean mill rates adjusted to represent percentage-equalizing revenue (column (4)) for the following jurisdiction groups: Rural; Total Urban; R.C.S.S.D.; Other; and Total Sample. This pattern was found to be the same as for the mean mill rates comprised of basic mill rates and mill rates representing the incidence of the hypothetical SREG formulation (column (3)).

Discussion

The foregoing findings are analogous to the findings for the last section on effort equalization: with the 80 per cent provision removed, the only mathematical difference between the SREG formulation and the percentage-equalizing formulation is that the former has a pro-ration provision to prorate grants where the net mill rate is lower than that specified. Since comparative analysis of the two mill rate configurations yielded no significant differences between mean mill rates adjusted to represent the incidence of SREG revenue and mean mill rated adjusted to represent the incidence of percentage-equalizing revenue, it was concluded that there were no significant differences in potential for achieving equalization of effort between the two formulations. For this sample, it was concluded that the percentage-equalizing formulation did not achieve a statistically significant degree of wealth equalization more than was achieved by the SREG formulation.

The foregoing conclusion is not a reliable generalization, however. If the number of jurisdictions pro-rating grants or if the number of jurisdictions receiving SREG support under the 80 per cent provision were to increase sharply, then the percentage-equalizing formulation

would probably be more effective in equalizing effort. Since both of the foregoing conditions have not occurred to date (August, 1982), it seems unlikely that these conditions would be allowed to become significant disequalizing factors.

SUMMARY

In this chapter, six major questions were considered in two major parts of the chapter. Each of these major parts was subdivided into two sections. These divisions provided the structure for the analysis of the data in the study.

The first section of the first major part of the chapter contained an examination of the equalization of wealth achieved by the SREG or Supplementary Requisition Equalization Grant. A second question in this same section involved an examination of the effects of a save harmless provision in the SREG formulation.

From an analysis of the data, it was concluded that the SREG formulation did have statistically significant equalizing effects upon wealth or assessment per pupil for the jurisdictions in the sample. Although the equalizing effects upon wealth were not statistically significant for some jurisdiction types, namely Large Urban, Other Major Urban, Total Urban, and Public Districts, nevertheless there was a general trend toward greater wealth equalization evidenced by the fact that equalizing effects for the Total Sample group were found to be statistically significant.

A second consideration in this section was the effect of the 80 per cent or save harmless provision upon wealth equalization. From the

analysis of the data it was concluded that the effects of this provision were not statistically significant. Also, somewhat greater equalization of wealth resulted from the operation of the provision than would have been the case if the 80 per cent provision had been eliminated from the SREG formulation. This last observation is inconclusive in that more corroborative data would be necessary to render the observation reliable beyond the contexts of this study. This last finding was also somewhat unexpected because save harmless or "grandfather" provisions, which the 80 per cent provision is in part, are often considered potentially disequalizing, as Garms, Guthrie, and Pierce (1978:210) have observed.

The equalization of effort achieved by the SREG formulation and by a SREG formulation without the 80 per cent provision were examined in the second section of the first major part of this chapter. On the basis of the findings from the data analysis, it was concluded that SREG in either form had resulted in greater equalization of effort generally among all school jurisdictions in the sample. With the exception of the Large Urban and the Public Districts groups, it was concluded that the reduction in variation of rates (i.e., the tendency toward equalization of effort) resulting from the incidence of the grant was statistically significant, even for the Total Sample.

The hypothetical SREG formulation excluding the 80 per cent provision did not have as great an equalizing effect upon effort as the regular SREG formulation did. The hypothetical formulation produced statistically significant effort equalization for all jurisdiction groups except the Large Urban, Other Major Urban, and Public Districts groups. The differences in the effort equalizing effects of the two formulations, however, were not statistically significant.

The second major part of the chapter was divided into two sections, the first of which contained a comparison of the effects of the wealth equalizing potentials of the 1980 SREG formulation and a percentage equalization formulation. On the basis of the analysis of the data, it was concluded that the percentage-equalizing formulation produced approximately the same wealth equalizing effects as the hypothetical SREG formulation which excluded the 80 per cent provision. Statistically significant reductions in per pupil wealth variation under both formulations were found for all jurisdiction groups with the exception of Large Urban, Total Urban, and Public Districts. While the data are inconclusive, it appeared that although both formulations achieved approximately the same degree of wealth equalization, the regular SREG formulation created slightly more equalization of wealth. The differences, however, are negligible and very probably specific to the sample and the year in the study.

The last section of the analysis was about the comparative degree of effort equalization achieved by the SREG formulation and the percentage-equalizing grant formulation developed in this study. It was concluded from an analysis of the data that no significant differences in effort equalizing potential existed between the two grant formulations. The SREG formulation appeared to have produced a significant reduction in variation of mill rates for the Rural, Other Major Urban, Total Urban, R.C.S.S.D.'s, Other, and Total Sample jurisdiction groups. The percentage-equalization formulation appeared to have produced a significant reduction in the variation of mill rates for all of the above-noted jurisdictions except the Other Major Urban jurisdiction group. Again,

the SREG formulation appeared to have performed slightly better, but the results were inconclusive.

The general conclusion on fiscal equalization of local taxation to support education was that the 1980 Supplementary Requisition Equalization Grant did achieve a greater degree of equalization of wealth and of effort among Alberta School jurisdictions than would have existed in the absence of the grant.

Further, it was concluded that the two features which distinguish the SREG formulation from a percentage-equalizing formulation are the pro-ration of grants for mill rates lower than those specified and the provision which allows a jurisdiction to be eligible for a grant which is the greater of the grant for the present year or 80 per cent of the grant allocated in the previous year. While these features might conceivably place constraints upon the effectiveness of the SREG formulation, it was concluded that a percentage-equalizing formulation without the provisions noted was not significantly more or less effective than SREG in achieving a greater degree of fiscal equalization.

CHAPTER V

SUMMARY AND IMPLICATIONS OF THE STUDY

A summary of the study, implications of the findings for current funding practice and suggestions for further research are presented in this chapter.

SUMMARY OF THE STUDY

The Purposes of the Study

The purposes of the study were first, to test the extent of fiscal equalization of locally levied supplementary school tax revenues achieved by the Supplementary Requisition Equalization Grant (SREG), and second to examine the relative fiscal equalizing potential of a percentage-equalizing formulation in comparision with the equalization potential of the SREG formulation. Fiscal equalization was considered in two aspects in this study: (1) equalization of effort or tax rate per pupil; and (2) equalization of wealth or assessment per pupil.

The Questions for Research

The purposes of the study were expressed in the following questions for research:

1. Fiscal Equalization: THE SREG Formulation

   1.1 To what extent was equalization of wealth among Alberta school jurisdictions achieved through the supplementary requisition equalization grant?

   1.2 To what extent would equalization of wealth have been enhanced if the "grandfather" or save harmless provision had been removed from the SREG formulation?

   1.3 To what extent was equalization of effort for required local taxation achieved among Alberta school jurisdictions through the supplementary requisition equalization grant?

   1.4 To what extent would equalization of effort for local taxation have been enhanced if the "grandfather" or save harmless provision had been removed from the SREG formulation?

2. Fiscal Equalization: A Percentage-Equalizing Formulation

   2.1 Would a percentage-equalizing grant formulation have achieved a greater or lesser degree of wealth equalization among Alberta school jurisdictions if it had been used in place of the SREG.

   2.2 Would a percentage-equalizing grant formulation have achieved a greater or lesser degree of equalization of effort for required local taxation among Alberta school jurisdictions if it had been used in place of the SREG formulation?

The Population and Sources of Data

The population for this study was comprised of 136 Alberta school jurisdictions operational in 1979. The population included all 60 rural jurisdictions (counties and school divisions) and 76 of the "urban"

jurisdictions. A complete listing of these jurisdictions is presented in Appendix A.

The data for the years 1978 and 1979 for the jurisdictions in the study were made available by Alberta Education. The base-line financial and enrolment data are presented in Appendix B.

Findings and Conclusions

Equalization of wealth achieved by the regular SREG formulation was tested by comparing equalized property assessments per pupil with per pupil assessments which also included imputed assessments to represent the additional assessment requirement to raise the SREG revenue, if any, received by each jurisdiction at the initial net mill rate or effort. The analysis indicated that among the 136 jurisdictions generally, the incidence of the SREG support had resulted in a significantly greater degree of equalization of wealth than would have occurred without the grant support. Significantly greater equalization was also found to have resulted among jurisdictions in groups within the total sample, specifically the rural jurisdictions (school divisions and counties as a group), Roman Catholic Separate school districts, and the group of jurisdictions labelled "Other" and comprised of regional high school districts, Protestant Separate school districts, and consolidated school districts.

Equalization of wealth achieved by the SREG formulation but excluding revenue allocated under the "grandfather" or "80 per cent" provision was tested in the same way as the regular SREG formulation was tested. The analysis indicated that the support under this hypothetical SREG formulation resulted in a significantly greater degree of wealth equali-

zation among all 136 school jurisdictions and also among jurisdiction groups within the total sample, specifically the rural jurisdictions, the Roman Catholic Separate school districts, and the jurisdictions in the Other group.

Analysis of the data also indicated no significant differences between the two SREG formulations in wealth equalization. It was therefore concluded that the "grandfather" provision had no significant effects upon wealth equalization per pupil among jurisdictions in the sample for the year under consideration.

Equalization of effort or taxation burden achieved by the SREG formulation was tested by establishing a basic mill rate or required mill rate and then establishing a second mill rate by representing the incidence of the SREG revenue as a mill rate equivalent on the equalized assessment and adding that mill rate equivalent to the basic mill rate. The basic mill rate was the net mill rate necessary to raise the supplementary requisition plus operating budgetary deficits or minus operating budgetary surpluses. The basic mill rate and the second mill rate comprised of a basic mill rate and an imputed mill rate for SREG revenue were then compared. Analysis of the data indicated that the effort equalization provided by the incidence of the grant had been statistically significant among the jurisdictions in the sample. It was also concluded that the incidence of revenue allocated under the SREG formulation had resulted in a significantly reduced variation in effort among jurisdictions in groups within the total sample, specifically the rural jurisdictions, the major urban jurisdictions other than the four large districts in Edmonton and Calgary, the Total Urban group, the R.C.S.S.D.'s, and the Other.

Equalization of effort achieved by the SREG formulation excluding revenue under the 80 per cent provision was tested by a method similar to the method described for the regular SREG formulation. Analysis of the data indicated that the significantly reduced variation in effort had resulted from the incidence of the grant among jurisdictions in the sample generally and among jurisdictions in groups within the total sample, specifically the Rural, Total Urban, R.C.S.S.D. and Other jurisdiction groups.

Analysis of the data further indicated that there were no statistically significant differences between the two SREG formulations in terms of equalization of effort.

The second major purpose of the study was to examine the comparative effects upon wealth equalization and effort equalization of a SREG formulation and a percentage-equalizing formulation. Equalization of wealth achieved by the two formulations was examined through the method used to test the two SREG formulations. A comparable percentage-equalizing grant was calculated for each jurisdiction on approximately the same parameters as the SREG formulation. Thus the incidence, but not necessarily the amount, of the SREG support was approximately equivalent to the percentage-equalizing formulation support. Then each percentage-equalizing grant was imputed the assessment required to raise the revenue from the grant at the net mill rate which the supplementary requisition represented in each jurisdiction. Analysis of the data indicated that the percentage-equalizing formulation had yielded equalization of wealth to the approximate degree that the SREG formulation excluding 80 per cent revenue had done. That is, the incidence of the percentage-equalizing formulation appeared to have resulted in a signi-

ficantly reduced variation in per pupil assessments among the jurisdictions as a group and among jurisdictions within groups, specifically among Rural, R.C.S.S.D., and Other jurisdiction groups.

No statistically significant differences were found between the two formulations in terms of equalization of wealth. It was concluded that the primary reason for a lack of difference in equalization effect was that essentially the SREG formulation was a percentage-equalizing formulation with a grandfather and a proration provision, neither of which had wealth-equalizing effects which were significantly different from the percentage-equalizing formulation. No significant differences in wealth equalization were found to exist between the SREG formulation and a hypothetical SREG formulation excluding revenue allocated under the grandfather provision.

The differences between the hypothetical SREG formulation and the percentage-equalizing was that the former retained the proration provision. Analysis of the data indicated that there were no significant differences in wealth equalization achieved by either the hypothetical SREG formulation or the percentage-equalizing formulation. It was concluded that both the regular SREG formulation and a percentage-equalizing formulation achieved approximately the same degree of wealth equalization. It was also realized that the foregoing conclusion supported the view that proration of grants did not have a significant effect upon wealth equalization for the jurisdictions in the study in 1979.

Comparison of the relative degree of equalization of effort achieved by the SREG formulation and a percentage-equalizing formulation was an extension of the procedure used to test differences in degree of effort equalization achieved by the regular SREG formulation and a hypo-

thetical SREG formulation which omitted the revenue allocated under the "grandfather" provision. In addition to the basic mill rate, two mill rates were established. Each represented the incidence of the grant revenue under the particular SREG formulation (including, or excluding, the 80 per cent provision) as a mill rate equivalent on the equalized assessment and adding that mill rate equivalent to the basic mill rate.

To test the percentage-equalizing formulation, the grants calculated under the formulation in the previous section (wealth equalization) were represented as mill rates on the respective equalized assessments and added the respective basic mill rates. Then the "percentage-equalizing mill rate" was compared with the SREG-representative mill rate.

Analysis of the data indicated that the mill rate representing percentage-equalizing revenue functioned much as the other SREG formulations in terms of effort equalization. Mean mill rates representing each of the formulations were found to be significantly different from the mean basic mill rate for the Total Sample, the Rural, Total Urban, R.C.S.S.D. and Other Jurisdiction groups. The mean mill rate representing the regular SREG formulation was found to be significantly different from the basic mill rate in the Other Major Urban jurisdiction group. Based on the foregoing and on the reduction in variation in mill rate resulting from the incidence of the grant, it was therefore concluded that the incidence of the percentage-equalizing grant formulation had a significant effort equalizing effect.

Further analysis of data and comparison of the SREG formulation and the percentage-equalizing formulation yielded no significant differences in the effort equalizing effects of the two formulations. Because no

in the effort-equalizing effects of the two formulations. Because no significant differences in effort-equalizing effects appeared to exist among the three formulations, it was concluded that the proration of grants had no significant effect upon equalization of effort. This last conclusion, however, may be specific only to the jurisdictions included in the study for the year under consideration.

IMPLICATIONS OF THE FINDINGS: POLICY

The present study is concerned with fiscal equalization of local tax revenues for education. It should be noted, however, that none of the grant formulations presented in the study equalized revenue per pupil to the provincial average supplementary requisition per pupil.

The total cost of the SREG support for the 136 jurisdictions was calculated at approximately $17.3 million. Providing revenue sufficient to equalize per pupil revenues to the average revenue per pupil for the jurisdictions in this study would require an estimated $41.9 million. This amount of equalization has important implications for government policy on funding and for the mix of central and local control of education.

Increasing SREG support to guarantee the average yield at an average mill rate would unquestionably result in a substantial increase in unconditional grant revenue.

This increase in grant revenue which is not tied to cost or a cost unit would provide boards with an increased range of local discretion in education expenditures. The provincial government would on balance probably lose in terms of its ability to control education at the local

level. Therefore increasing the grant to provide support to the provincial average would require thorough consideration of appropriate mixes of local and provincial control of, and responsibility for, education.

IMPLICATIONS OF THE FINDINGS: RESEARCH

A major inference of the general conclusions of the study was that the basic funding model, whether district power-equalizing, guaranteed tax base, percentage-equalizing or guaranteed yield, may not be as significant for equalization as the level of support provided. The major differences among these formulations appears to be the underlying philosophic assumptions and policy considerations which are operationalized in grandfather provisions, funding ceilings, lower and upper tax rate limits, and other components which represent compromises between leeway and uniformity; between local autonomy and fiscal equalization.

SUGGESTIONS FOR FURTHER RESEARCH

One of the major limitations of this study was that it was the examination of one grant over one year. Examination of the effects of the grant over a longer time span (i.e., since its implementation to the present) would possibly yield somewhat different results and would provide further insights into the operational effects of the grant, for example, the effects of the save harmless provision.

Another area for research which the researcher considered including in the present study was the matter of the inclusion of electric power and pipeline tax revenue in the supplementary school requisition. The

question for research might be expressed as follows: How would the present level of fiscal equalization (per pupil wealth and taxpayer effort per pupil) among school jurisdictions in Alberta be affected if electric-power and pipeline tax revenues were not available for school purposes?

Another related area for research which became evident in the study was the matter of whether assessment per pupil is in fact a relatively accurate measure of wealth. In their report to the Minister's Task Force on School Finance (1981:101), Nichols and Associates indicated that real growth in assessment was approximately 5 per cent to 6 per cent per year from 1976-79. In the same period the increase in equalized assessments averaged over 19 per cent annually. So long as property remains the sole source of local school tax revenue, assessment per pupil probably is the best criterion of relative wealth or ability to pay among school jurisdictions. Nevertheless research into the reliability of the equalized assessment as a relative wealth measure among jurisdictions would possibly add useful information about an important issue in taxation.

Finally, the over-riding purpose of this study was to increase understanding and knowledge of a particular aspect of school finance. It is hoped that this study is a useful contribution to the study of school finance and to educational research.

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APPENDIX A

LIST OF SCHOOL JURISDICTIONS IN THIS STUDY

Appendix A

School Divisions, Counties, and School Districts Included in This Study

A. SCHOOL DIVISIONS

NUMBER ASSIGNED IN THIS STUDY		NUMBER ASSIGNED IN THIS STUDY	
1010	Berry Creek No. 1	1160	Provost No. 33
1020	Cardston No. 2	1170	Westlock No. 37
1030	Medicine Hat No. 4	1180	Foothills No. 38
1040	Taber No. 6	1190	Rocky View No. 41
1050	Acadia No. 8	1200	Bonnyville No. 46
1060	Rangeland No. 9	1210	Spirit River No. 47
1070	Peace River No. 10	1220	High Prairie No. 48
1080	Yellowhead No. 12	1230	Fairview No. 50
1090	Rocky Mountain No. 15	1240	Lac La Biche No. 51
1100	Neutral Hills No. 16	1250	Fort Vermilion No. 52
1110	Sturgeon No. 24	1260	East Smoky No. 54
1120	Willow Creek No. 28	1270	Three Hills No. 60
1130	Pincher Creek No. 29	1280	Northland No. 61
1140	Starland No. 30	1290	Drumheller Valley No. 62
1150	Wainwright No. 32	1300	Crowsnest Pass No. 63

B. COUNTIES

2010	Grande Prairie No. 1	2160	Mountain View No. 17
2020	Vulcan No. 2	2170	Paintearth No. 18
2030	Ponoka No. 3	2180	St. Paul No. 19
2040	Newell No. 4	2190	Strathcona No. 20
2050	Warner No. 5	2200	Two Hills No. 21
2060	Stettler No. 6	2210	Camrose No. 22
2070	Thorhild No. 7	2220	Red Deer No. 23
2080	Forty Mile No. 8	2230	Vermilion River No. 24
2090	Beaver No. 9	2240	Leduc No. 25
2100	Wetaskiwin No. 10	2250	Lethbridge No. 26
2110	Barrhead No. 11	2260	Minburn No. 27
2120	Athabasca No. 12	2270	Lac Ste. Anne No. 28
2130	Smoky Lake No. 13	2280	Flagstaff No. 29
2140	Lacombe No. 14	2290	Lamont No. 30
2150	Wheatland No. 16	2300	Parkland No. 31

C. PUBLIC SCHOOL DISTRICTS

3010	St. Albert No. 3	3200	Brooks No. 2092
3020	Edmonton No. 7	3220	St. Paul No. 2228
3030	Calgary No. 19	3230	Redcliff No. 2283
3040	Lethbridge No. 51	3240	Grande Prairie No. 2357
3050	Medicine Hat No. 76	3250	Bonnyville No. 2665
3060	Banff No. 102	3260	Fort McMurray No. 2833
3070	Red Deer No. 104	3280	Jasper No. 3063
3080	Canmore No. 168	3310	Seebe No. 4152
3100	Wetaskiwin No. 264	3320	Waterton Park No. 4233
3110	Stirling No. 647	3340	Grovedale No. 4910
3130	Camrose No. 1315	3350	Devon No. 4972
3140	Stettler No. 1475	3430	Swan Hills No. 5109
3150	Exshaw No. 1699	3450	Grande Cache No. 5258
3160	Legal No. 1738		

Appendix A (Cont'd)

School Divisions, Counties, and School Districts
Included in This Study

D. ROMAN CATHOLIC SEPARATE SCHOOL DISTRICTS

NUMBER ASSIGNED IN THIS STUDY		NUMBER ASSIGNED IN THIS STUDY	
4010	Calgary No. 1	4270	Taber No. 54
4020	Edmonton No. 7	4280	High Prairie No. 56
4030	Lethbridge No. 9	4320	Camrose No. 60
4040	Wetaskiwin No. 15	4360	Cold Lake No. 64
4050	Vegreville No. 16	4370	Provost No. 65
4060	Red Deer No. 17	4380	Grande Centre No. 67
4070	Pincher Creek No. 18	4390	Beaverlodge No. 68
4080	Medicine Hat No. 21	4420	Coaldale No. 73
4090	Theresetta No. 23	4480	Picture Butte No. 79
4100	Drumheller No. 25	4500	Bow Island No. 82
4110	Fort Vermilion No. 26	4520	Valleyview No. 84
4130	Grande Prairie No. 28	4550	Crimshaw No. 88
4140	McLennan No. 30	4570	Whitecourt No. 94
4150	Wainwright No. 31	4580	Ponoka No. 95
4160	Fort McMurray No. 32	4590	Nampa No. 96
4170	St. Thomas More No. 35	4600	Vermilion No. 97
4180	Spirit River No. 36	4670	Fort Saskatchewan No. 104
4190	Rosary No. 37	4680	Sherwood Park No. 105
4210	Peace River No. 43	4720	Westlock No. 110
4240	Killam No. 49	4730	Drayton Valley No. 111
4250	Assumption No. 50	4900	Spruce Grove No. 128
4260	Sexsmith No. 51		

E. OTHER JURISDICTIONS

5010	Barons Consolidated School District No. 8
5020	Lousana Consolidated School District No. 38
5030	Fahler Consolidated School District No. 69
6010	Thibault Catholic Public School District No. 35
7010	Glen Avon Protestant Separate School District No. 5
7020	St. Albert Protestant Separate School District No. 6

APPENDIX B

SUMMARY OF THE DATA USED IN THE STUDY

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION	E.P.+ P.L. TAX REVENUE CREDIT	EQUALIZED ASSESSMENT	OPERATING SURPLUSES(DEFICITS)	1978 SREG SUPPORT
1010	165	186045	92184	7441780	(9513)	0
1020	2106	497362	20232	22510800	(190991)	238817
1030	1179	1059869	482463	28027860	(33632)	0
1040	2690	999890	90792	28245500	29668	308586
1050	658	637933	185902	19900860	117659	0
1060	906	514995	108682	16612660	106799	0
1070	2941	1070194	172199	29885310	100266	317470
1080	5207	2329728	517635	58902610	262433	378004
1090	2897	967417	476578	38774230	(36058)	2158
1100	568	419245	117884	11236810	14748	0
1110	4280	2491235	210682	69490510	(175860)	140076
1120	2635	1318233	78238	38612570	154870	167350
1130	1341	717268	69374	24793240	29419	0
1140	599	361336	19615	11750760	(9361)	0
1150	1548	672622	131214	20811330	49858	88966
1160	841	549941	146965	14377530	4555	0
1170	2511	1030527	93322	26262160	149832	306101
1180	4309	2279373	189823	76386490	266689	127256
1190	5853	3525117	243390	128560060	57264	0
1200	2665	698425	17419	22356760	206180	435221
1210	1690	598457	76141	15794590	61454	208742

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION	E.P.+ P.L. TAX REVENUE CREDIT	EQUALIZED ASSESSMENT	OPERATING SURPLUSES(DEFICITS)	1978 SREG SUPPORT
1220	3285	1120782	297699	28475080	(213117)	340358
1230	1693	494277	81428	15312180	100406	204490
1240	2149	340927	11300	11756090	105175	407261
1250	1974	581406	262437	12242700	38179	176288
1260	1766	1033029	500217	32883040	(129677)	0
1270	1680	1091050	170096	30546430	48997	0
1280	1604	1223160	499865	20461030	(217710)	0
1290	1112	422362	3746	17058240	38400	72908
1300	1437	586924	16511	15672210	97631	179811
2010	3423	1351502	18432	40867900	60644	283711
2020	1189	742507	34863	25603680	(627)	0
2030	2844	1307034	73406	35039820	(47788)	309383
2040	1819	1150897	410177	22331790	185879	0
2050	1739	780829	38948	21328300	65797	172959
2060	1289	609221	132149	19034100	67057	0
2070	921	354390	62600	9609280	(13967)	86056
2080	1059	744301	78862	19319530	151740	0
2090	1895	781508	142764	23245360	87971	142910
2100	2301	888321	153352	26661710	(77062)	186053
2110	2232	618184	65467	21338830	(94979)	284417
2120	2099	814424	129899	22406160	35496	242910

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION	E.P.+ P.L. TAX REVENUE CREDIT	EQUALIZED ASSESSMENT	OPERATING SURPLUSES(DEFICITS)	1978 SREG SUPPORT
2130	1025	428241	39464	12977000	3154	111910
2140	3752	1493569	165930	51132120	73278	273734
2150	1974	1243802	141318	49752090	427886	0
2160	4099	1507705	268102	64307540	(53776)	178606
2170	1032	618715	269871	16272810	(68992)	0
2180	1849	474742	22375	13071080	(118726)	315569
2190	12851	7288970	165501	282059250	(197211)	0
2200	1176	498744	46001	15924130	(51155)	98926
2210	2227	747812	103302	25680370	(154562)	194329
2220	4919	1978860	162273	69141590	74222	341202
2230	2453	925892	93295	30357120	158578	184329
2240	6191	2613746	377500	92097760	64057	317767
2250	3158	1196663	60982	35753280	111765	364298
2260	1910	1090459	99554	30098230	88937	52550
2270	3430	799883	165358	43673640	83944	160063
2280	2074	734799	148199	26065960	50334	110446
2290	1761	757745	16382	24185920	87192	161446
2300	9440	4443782	1398705	138868170	166024	163565
3010	2636	941921	0	35075880	43833	211152
3020	59708	49265000	0	1896486890	(3358477)	0
3030	78788	54671000	0	2072814910	258246	0

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION	E.P.+ P.L. TAX REVENUE CREDIT	EQUALIZED ASSESSMENT	OPERATING SURPLUSES(DEFICITS)	1978 SREG SUPPORT
3040	7492	5069037	1290	170387820	259351	42315
3050	5007	3258359	11417	102625490	23331	131984
3060	404	646023	0	33894150	192980	0
3070	5947	3541290	0	117222450	269076	248878
3080	515	332845	11608	16842540	17571	0
3100	1332	755550	0	24530860	(217483)	49968
3110	200	42841	1080	1811460	(30072)	25816
3130	1650	895617	0	34079790	(61868)	28625
3140	954	480190	2107	13918570	65289	89061
3150	67	117966	17396	5117860	7827	0
3160	383	120310	10358	5689900	38188	34930
3200	1763	729600	22043	25937440	(14781)	110480
3220	671	312772	528	9871320	26067	64880
3230	833	264932	3118	9654950	(98)	83282
3240	3133	1892334	0	51171820	(122732)	175330
3250	758	265571	3093	9835940	0	73876
3260	4045	4458255	128808	136296420	870143	24573
3280	572	493258	0	21585290	(22425)	0
3310	15	17300	2732	803390	1480	0
3320	25	8446	0	1325080	552	0
3340	183	15403	10141	406950	24839	22546

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION	E.P.+ P.L. TAX REVENUE CREDIT	EQUALIZED ASSESSMENT	OPERATING SURPLUSES(DEFICITS)	1978 SREG SUPPORT
3350	762	390812	0	11159070	64954	57186
3430	540	445602	253773	11312570	12840	0
3450	949	575439	155357	17614680	29148	0
4010	21113	9081104	0	347139580	391464	1193733
4020	25598	15168939	0	584992100	(246715)	393638
4030	2017	1208744	0	40211050	47478	22822
4040	268	46187	0	1516800	(5545)	51447
4050	216	162983	66	5176330	53979	0
4060	1313	601820	0	19190600	(26673)	145227
4070	189	44274	3719	1454850	(10075)	27084
4080	1797	799413	321	25251470	136786	154313
4090	82	23500	10253	576510	(1347)	10219
4100	291	75000	231	2942400	35872	36454
4110	141	16317	10494	264850	(1618)	18873
4130	1085	353099	0	9994310	(1798)	115977
4140	213	18468	163	1023710	(17596)	38059
4150	230	56554	739	2145860	14825	31567
4160	2133	1389228	31616	42471040	14922	237128
4170	255	69086	3345	1935170	1513	32195
4180	64	16014	505	435870	16666	10401
4190	106	31608	1026	1067110	9737	12542

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION	E.P.+ P.L. TAX REVENUE CREDIT	EQUALIZED ASSESSMENT	OPERATING SURPLUSES(DEFICITS)	1978 SREG SUPPORT
4210	516	143192	871	3998670	280	81624
4240	52	17617	3652	642250	5766	3586
4250	73	17270	326	593870	914	16386
4260	70	26440	109	799530	(16743)	11966
4270	339	140708	724	4461250	19476	39192
4280	225	42275	3194	1388920	(18049)	36865
4320	521	129405	0	4924100	66725	83656
4360	153	31025	341	990580	(1429)	29090
4370	163	52719	747	1877470	12157	21233
4380	223	48371	11	1544420	13561	32758
4390	73	6571	6	198700	5482	16531
4420	285	61123	1586	2182970	32132	48981
4480	137	54036	1936	1929860	5585	10776
4500	158	60676	2445	1660540	29108	20307
4520	166	17799	406	1112430	(93733)	16026
4550	140	34074	474	951530	8344	22683
4570	415	43084	195	3010780	77899	62010
4580	70	60555	3805	1727580	2305	7586
4590	45	8552	4743	251740	9669	4554
4600	226	56974	5780	1894920	8249	38010
4670	620	234800	0	9370820	(21351)	24647

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION	E.P.+ P.L. TAX REVENUE CREDIT	EQUALIZED ASSESSMENT	OPERATING SURPLUSES(DEFICITS)	1978 SREG SUPPORT
4680	2430	651199	0	24343880	9169	337604
4720	248	89794	329	3662090	12483	29067
4730	379	49889	18395	2274890	11595	58282
4900	143	112938	0	5113970	91923	4783
5010	58	43449	2856	1554150	7817	0
5020	37	11710	2064	653100	(13434)	0
5030	283	101001	1112	3482810	(42037)	35479
6010	885	186126	3524	11489240	25222	67047
7010	367	159548	81	5414820	22495	32516
7020	4871	1752004	0	65453350	165578	417907

APPENDIX C

DATA RELATED TO WEALTH EQUALIZATION, BY JURISDICTION

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION GRANT (WITHOUT 80%)		PERCENTAGE EQUALIZING GRANT	EQUALIZED ASSESSMENT PER PUPIL			
					A	B	C	D
1010	165	0	0	0	89398	89398	89398	89398
1020	2106	308007	308007	309524	11142	18008	18008	18042
1030	1179	0	0	0	43636	43636	43636	43636
1040	2690	372053	372053	372053	11549	18042	18042	18042
1050	658	0	0	0	42683	42683	42683	42683
1060	906	0	0	0	23241	23241	23241	23241
1070	2941	371603	371603	371603	12110	18042	18042	18042
1080	5207	388034	388034	388034	14544	18042	18042	18042
1090	2897	1726	0	0	26380	26408	26380	26380
1100	568	0	0	0	27522	27522	27522	27522
1110	4280	112061	27918	27917	17736	18965	18042	18042
1120	2635	138290	138290	138290	15578	18042	18042	18042
1130	1341	0	0	0	20468	20468	20468	20468
1140	599	0	0	0	20743	20743	20743	20743
1150	1548	71173	44183	44183	16702	18861	18042	18042
1160	841	0	0	0	23331	23331	23331	23331
1170	2511	349893	349893	349893	11500	18042	18042	18042
1180	4309	101805	0	0	19338	20447	19338	19338
1190	5853	0	0	0	23594	23594	23594	23594
1200	2665	535780	535780	535780	8604	18042	18042	18042
1210	1690	264000	264000	264000	10708	18042	18042	18042

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION GRANT	(WITHOUT 80%)	PERCENTAGE EQUALIZING GRANT	EQUALIZED ASSESSMENT PER PUPIL A	B	C	D
1220	3285	436535	436535	436536	11803	18042	18042	18042
1230	1693	260143	260143	260143	10828	18042	18042	18042
1240	2149	566872	566872	566872	5658	18042	18042	18042
1250	1974	283286	283286	283286	11305	18042	18042	18042
1260	1766	0	0	0	36211	36211	36211	36211
1270	1680	0	0	0	21541	21541	21541	21541
1280	1604	0	0	0	21572	21572	21572	21572
1290	1112	60750	60750	60750	15477	18042	18042	18042
1300	1437	208758	208758	208758	11222	18042	18042	18042
2010	3423	432937	432937	432937	12104	18042	18042	18042
2020	1189	0	0	0	22595	22595	22595	22595
2030	2844	302190	302190	302190	13054	18042	18042	18042
2040	1819	0	0	0	19075	19075	19075	19075
2050	1739	190155	190155	19015	12909	18042	18042	18042
2060	1289	0	0	0	18857	18857	18857	18857
2070	921	105352	105352	10535	12672	18042	18042	18042
2080	1059	0	0	0	20405	20405	20405	20405
2090	1895	122459	122459	12245	15008	18042	18042	18042
2100	2301	197888	197888	19788	14005	18042	18042	18042
2110	2232	349405	349405	34940	10693	18042	18042	18042
2120	2099	238829	238829	23882	12700	18042	18042	18042

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION GRANT	(WITHOUT 80%)	PERCENTAGE EQUALIZING GRANT	EQUALIZED ASSESSMENT PER PUPIL			
					A	B	C	D
2130	1025	89528	89440	8944	13946	18046	18042	18042
2140	3752	218987	216660	21666	15331	18071	18042	18042
2150	1974	0	0	0	28434	28434	28434	28434
2160	4099	142885	0	0	19082	20718	19082	19082
2170	1032	0	0	0	27967	27967	27967	27967
2180	1849	418385	418385	41838	7419	18042	18042	18042
2190	12851	0	0	0	22458	22458	22458	22458
2200	1176	79141	78290	7829	14917	18076	18042	18042
2210	2227	221172	221172	22117	13380	18042	18042	18042
2220	4919	286101	286101	28610	15312	18042	18042	18042
2230	2453	223627	223627	22362	13762	18042	18042	18042
2240	6191	254214	86369	8636	17387	19315	18042	18042
2250	3158	411182	411182	41118	11929	18042	18042	18042
2260	1910	42040	28512	2851	17341	18375	18042	18042
2270	3430	128050	99230	14547	16051	17804	17409	18042
2280	2074	101566	101566	10156	15743	18042	18042	18042
2290	1761	150209	150209	15020	14038	18042	18042	18042
2300	9440	130852	0	0	21468	22118	21468	21468
3010	2636	371126	371126	37112	13306	21000	21000	21000
3020	59708	0	0	0	31763	31763	31763	31763
3030	78788	0	0	0	26309	26309	26309	26309

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION GRANT	(WITHOUT 80%)	PERCENTAGE EQUALIZING GRANT	EQUALIZED ASSESSMENT PER PUPIL A	B	C	D
3040	7492	33852	0	0	22748	22995	22748	22748
3050	5007	105587	39541	3954	20568	21721	21000	21000
3060	404	0	0	0	83896	83896	83896	83896
3070	5947	199102	140261	14026	19711	21541	21000	21000
3080	515	0	0	0	33886	33886	33886	33886
3100	1332	62973	62973	6297	18417	21000	21000	21000
3110	200	42853	42853	4285	9292	21000	21000	21000
3130	1650	22900	10435	1043	20654	21413	21000	21000
3140	954	110790	110790	11079	14654	21000	21000	21000
3150	67	0	0	0	89599	89599	89599	89599
3160	383	33253	33253	3325	16256	21000	21000	21000
3200	1763	188079	188079	18807	15170	21000	21000	21000
3220	671	76914	76914	7691	14736	21000	21000	21000
3230	833	141332	141332	14133	11729	21000	21000	21000
3240	3133	267567	267567	26756	16333	21000	21000	21000
3250	758	109181	109181	10918	13129	21000	21000	21000
3260	4045	19658	0	0	34698	34963	34698	34698
3280	572	0	0	0	37737	37737	37737	37737
3310	15	0	0	0	63604	63604	63604	63604
3320	25	0	0	0	53003	53003	53003	53003
3340	183	34288	34288	4852	6509	16748	16748	21000

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION GRANT	(WITHOUT 80%)	PERCENTAGE EQUALIZING GRANT	EQUALIZED ASSESSMENT PER PUPIL A	B	C	D
3350	762	88626	88626	8862	14644	21000	21000	21000
3430	540	0	0	0	48663	48663	48663	48663
3450	949	0	0	0	25426	25426	25426	25426
4010	21113	1761072	1761072	176107	16442	21000	21000	21000
4020	25598	314910	0	0	22853	23525	22853	22853
4030	2017	39271	39271	3927	19936	21000	21000	21000
4040	268	75235	75235	7523	5660	21000	21000	21000
4050	216	0	0	0	23974	23974	23974	23974
4060	1313	153398	153398	15339	14616	21000	21000	21000
4070	189	43567	43567	4356	8404	21000	21000	21000
4080	1797	228300	228300	22830	14058	21000	21000	21000
4090	82	12797	12797	1279	12472	21000	21000	21000
4100	291	57819	57819	5781	10143	21000	21000	21000
4110	141	40605	40605	4060	5263	21000	21000	21000
4130	1085	234070	234070	23407	9211	21000	21000	21000
4140	213	61514	61514	6295	4849	20630	20630	21000
4150	230	48600	48600	4860	9453	21000	21000	21000
4160	2133	189702	24392	2439	20375	25235	21000	21000
4170	255	60781	60781	6078	7975	21000	21000	21000
4180	64	16359	16359	1635	7032	21000	21000	21000
4190	106	20553	20553	2055	10405	21000	21000	21000

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION GRANT	(WITHOUT 80%)	PERCENTAGE EQUALIZING GRANT	EQUALIZED ASSESSMENT PER PUPIL			
					A	B	C	D
4210	516	124675	124675	12467	7797	21000	21000	21000
4240	52	5157	5157	515	15581	21000	21000	21000
4250	73	16977	16977	1697	8292	21000	21000	21000
4260	70	12209	12209	1220	11469	21000	21000	21000
4270	339	48215	48215	4821	13228	21000	21000	21000
4280	225	58973	58973	5897	6677	21000	21000	21000
4320	521	110109	110109	11010	9451	21000	21000	21000
4360	153	40469	40469	4046	6546	21000	21000	21000
4370	163	27789	27789	2778	11684	21000	21000	21000
4380	223	57430	57430	5743	6927	21000	21000	21000
4390	73	24414	24414	2441	2724	21000	21000	21000
4420	285	68513	68513	6851	7864	21000	21000	21000
4480	137	16020	16020	1602	14610	21000	21000	21000
4500	158	29056	29056	2905	10951	21000	21000	21000
4520	166	36705	36705	4296	6858	18941	18941	21000
4550	140	36143	36143	3614	6893	21000	21000	21000
4570	415	81062	81062	10413	7288	17962	17962	21000
4580	70	6069	0	0	26334	31072	26334	26334
4590	45	5747	5747	695	12560	19538	19538	21000
4600	226	48260	48260	4826	9331	21000	21000	21000
4670	620	66780	66780	6678	15114	21000	21000	21000

JURISDICTION	RESIDENT PUPILS	SUPPLEMENTARY REQUISITION GRANT	SUPPLEMENTARY REQUISITION GRANT (WITHOUT 80%)	PERCENTAGE EQUALIZING GRANT	EQUALIZED ASSESSMENT PER PUPIL A	B	C	D
4680	2430	488356	488356	48835	10018	21000	21000	21000
4720	248	28044	28044	2804	14821	21000	21000	21000
4730	379	60297	60297	7970	9508	18202	18202	21000
4900	143	3826	0	0	35762	37224	35762	35762
5010	58	0	0	0	28681	28681	28681	28681
5020	37	0	0	0	21428	21428	21428	21428
5030	283	44312	44312	4431	12444	21000	21000	21000
6010	885	109251	109251	12579	13233	19978	19978	21000
7010	367	41897	41897	4189	14762	21000	21000	21000
7020	4871	674129	674129	67412	13437	21000	21000	21000
TOTAL	403234	17305440	15922600	16052530				
MEAN					21761	23922	23748	23764
S.D.					7693	5601	5672	5657
S.D./MEAN					0.354	0.234	0.239	0.238

A = EQUALIZED ASSESSMENT PER PUPIL;
B = ASSESSMENT PER PUPIL (EQUALIZED PLUS IMPUTED ASSESSMENT FOR SREG);
C = ASSESSMENT PER PUPIL (EQUALIZED PLUS IMPUTED ASSESSMENT FOR SREG LESS "80%" REVENUE);
D = ASSESSMENT PER PUPIL (EQUALIZED PLUS IMPUTED ASSESSMENT FOR PERCENTAGE EQUALIZING REVENUE)

APPENDIX D

DATA RELATED TO EQUALIZATION OF EFFORT, BY JURISDICTION

JURISDICTION	NET MILL RATE	BASIC MILL RATE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE (WITHOUT 80%)	BASIC MILL RATE ADJUSTED TO REFLECT PERCENTAGE EQUALIZING REVENUE
1010	12.61	13.26	13.26	13.26	13.26
1020	21.20	29.33	42.46	42.46	42.53
1030	20.60	21.25	21.25	21.25	21.25
1040	32.19	31.23	43.21	43.21	43.21
1050	22.71	18.52	18.52	18.52	18.52
1060	24.46	19.39	19.39	19.39	19.39
1070	30.05	27.23	37.67	37.67	37.67
1080	30.76	27.30	32.42	32.42	32.42
1090	12.66	13.13	13.15	13.13	13.13
1100	26.82	25.88	25.88	25.88	25.88
1110	32.82	35.13	36.61	35.50	35.50
1120	32.11	28.34	31.71	31.71	31.71
1130	26.13	25.06	25.06	25.06	25.06
1140	29.08	29.83	29.83	29.83	29.83
1150	26.02	24.09	26.84	25.80	25.80
1160	28.03	27.80	27.80	27.80	27.80
1170	35.69	30.50	42.61	42.61	42.61
1180	27.35	24.15	25.38	24.15	24.15
1190	25.53	25.11	25.11	25.11	25.11
1200	30.46	21.47	44.84	44.84	44.84

JURISDICTION	NET MILL RATE	BASIC MILL RATE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE (WITHOUT 80%)	BASIC MILL RATE ADJUSTED TO REFLECT PERCENTAGE EQUALIZING REVENUE
1210	33.07	29.67	44.26	44.26	44.26
1220	28.91	34.40	45.66	45.66	45.66
1230	26.96	21.49	35.68	35.68	35.68
1240	28.04	19.39	66.01	66.01	66.01
1250	26.05	24.34	37.04	37.04	37.04
1260	16.15	18.18	18.18	18.18	18.18
1270	30.15	28.80	28.80	28.80	28.80
1280	35.35	41.64	41.64	41.64	41.64
1290	24.54	22.31	25.84	25.84	25.84
1300	36.40	30.34	43.29	43.29	43.29
2010	32.62	31.16	41.60	41.60	41.60
2020	27.64	27.66	27.66	27.66	27.66
2030	35.21	36.49	44.63	44.63	44.63
2040	33.17	27.81	27.81	27.81	27.81
2050	34.78	31.85	40.32	40.32	40.32
2060	25.06	22.31	22.31	22.31	22.31
2070	30.37	31.56	40.59	40.59	40.59
2080	34.44	27.42	27.42	27.42	27.42
2090	27.48	24.39	28.69	28.69	28.69
2100	27.57	29.96	36.10	36.10	36.10

JURISDICTION	NET MILL RATE	BASIC MILL RATE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE (WITHOUT 80%)	BASIC MILL RATE ADJUSTED TO REFLECT PERCENTAGE EQUALIZING REVENUE
2110	25.90	29.88	44.52	44.52	44.52
2120	30.55	29.22	38.18	38.18	38.18
2130	29.96	29.74	36.00	36.00	36.00
2140	25.96	24.69	28.50	28.46	28.46
2150	22.16	14.54	14.54	14.54	14.54
2160	19.28	19.96	21.79	19.96	19.96
2170	21.44	23.83	23.83	23.83	23.83
2180	34.61	43.26	73.76	73.76	73.76
2190	25.26	25.94	25.94	25.94	25.94
2200	28.43	31.35	35.86	35.81	35.81
2210	25.10	30.28	37.71	37.71	37.71
2220	26.27	25.29	29.09	29.09	29.09
2230	27.43	22.73	29.35	29.35	29.35
2240	24.28	23.69	26.05	24.49	24.49
2250	31.76	28.80	39.71	39.71	39.71
2260	32.92	30.24	31.51	31.10	31.10
2270	14.53	13.00	15.33	14.81	15.65
2280	22.50	20.96	24.07	24.07	24.07
2290	30.65	27.13	33.20	33.20	33.20
2300	21.93	21.11	21.75	21.11	21.11

JURISDICTION	NET MILL RATE	BASIC MILL RATE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE (WITHOUT 80%)	BASIC MILL RATE ADJUSTED TO REFLECT PERCENTAGE EQUALIZING REVENUE
3010	26.85	25.60	36.18	36.18	36.18
3020	25.98	27.75	27.75	27.75	27.75
3030	26.38	26.25	26.25	26.25	26.25
3040	29.74	28.22	28.42	28.22	28.22
3050	31.64	31.41	32.44	31.80	31.80
3060	19.06	13.37	13.37	13.37	13.37
3070	30.21	27.91	29.61	29.11	29.11
3080	19.07	18.07	18.07	18.07	18.07
3100	30.80	39.67	42.23	42.23	42.23
3110	23.05	39.24	62.30	62.30	62.30
3130	26.28	28.10	28.77	28.40	28.40
3140	34.35	29.68	37.60	37.60	37.60
3150	19.65	18.35	18.35	18.35	18.35
3160	19.32	13.19	18.53	18.53	18.53
3200	27.28	27.83	34.86	34.86	34.86
3220	31.63	29.00	36.77	36.77	36.77
3230	27.12	27.13	41.59	41.59	41.59
3240	36.98	39.38	44.61	44.61	44.61
3250	26.69	26.69	37.66	37.66	37.66
3260	31.76	25.57	25.71	25.57	25.57

JURISDICTION	NET MILL RATE	BASIC MILL RATE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE (WITHOUT 80%)	BASIC MILL RATE ADJUSTED TO REFLECT PERCENTAGE EQUALIZING REVENUE
3280	22.85	23.89	23.89	23.89	23.89
3310	18.13	16.58	16.58	16.58	16.58
3320	6.37	5.96	5.96	5.96	5.96
3340	12.93	18.30	20.86	20.86	40.74
3350	35.02	29.20	37.14	37.14	37.14
3430	16.96	16.47	16.47	16.47	16.47
3450	23.85	22.64	22.64	22.64	22.64
4010	26.16	25.03	30.11	30.11	30.11
4020	25.93	26.35	26.89	26.35	26.35
4030	30.06	28.88	29.86	29.86	29.86
4040	30.45	34.11	83.71	83.71	83.71
4050	31.47	21.05	21.05	21.05	21.05
4060	31.36	32.75	40.74	40.74	40.74
4070	27.88	34.22	61.65	61.65	61.65
4080	31.65	26.23	35.27	35.27	35.27
4090	22.98	24.29	36.81	36.81	36.81
4100	25.41	13.26	32.85	32.85	32.85
4110	21.99	24.17	78.88	78.88	78.88
4130	35.33	35.51	58.93	58.93	58.93
4140	17.88	34.92	94.48	94.48	95.87

JURISDICTION	NET MILL RATE	BASIC MILL RATE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE (WITHOUT 80%)	BASIC MILL RATE ADJUSTED TO REFLECT PERCENTAGE EQUALIZING REVENUE
4150	26.01	19.19	41.54	41.54	41.54
4160	31.97	31.62	35.99	32.18	32.18
4170	33.97	33.23	63.12	63.12	63.12
4180	35.58	18.30	34.90	34.90	36.35
4190	28.66	19.83	38.47	38.47	38.47
4210	35.59	35.52	66.51	66.51	66.51
4240	21.74	14.63	20.99	20.99	20.99
4250	28.53	27.02	55.07	55.07	55.07
4260	32.93	53.79	69.00	69.00	69.00
4270	31.38	27.03	37.79	37.79	37.79
4280	28.14	40.15	79.40	79.40	79.40
4320	26.28	12.73	35.09	35.09	35.09
4360	30.98	32.40	72.81	72.81	72.81
4370	27.68	21.30	35.89	35.89	35.89
4380	31.31	22.53	59.71	59.71	59.71
4390	33.04	5.48	128.23	128.23	128.23
4420	27.27	12.94	43.51	43.51	43.51
4480	27.00	24.21	32.21	32.21	32.21
4500	35.07	18.24	35.04	35.04	35.04
4520	15.64	97.97	130.22	130.22	135.71

JURISDICTION	NET MILL RATE	BASIC MILL RATE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE	BASIC MILL RATE ADJUSTED TO REFLECT SREG REVENUE (WITHOUT 80%)	BASIC MILL RATE ADJUSTED TO REFLECT PERCENTAGE EQUALIZING REVENUE
4550	35.31	26.66	64.12	64.12	64.12
4570	14.25	18.30	15.29	15.29	34.43
4580	32.85	31.60	34.89	31.60	31.60
4590	15.13	18.30	8.19	8.19	12.30
4600	27.02	23.10	45.99	45.99	45.99
4670	25.06	27.33	34.46	34.46	34.46
4680	26.75	26.37	46.43	46.43	46.43
4720	24.43	21.03	28.66	28.66	28.66
4730	13.84	10.63	27.36	27.36	32.74
4900	22.08	4.11	4.86	4.11	4.11
5010	26.12	21.42	21.42	21.42	21.42
5020	14.77	31.71	31.71	31.71	31.71
5030	28.68	40.62	53.20	53.20	53.20
6010	15.89	13.74	23.07	23.07	24.48
7010	29.45	25.30	33.03	33.03	33.03
7020	26.77	24.24	34.54	34.54	34.54
MEAN	26.95	26.60	30.17	30.00	30.05
S.D.	3.79	4.52	8.68	8.75	8.75
S.D./MEAN	0.140	0.170	0.288	0.292	0.291